EFFECTIVENESS OF NUTRITIONAL INTERVENTION PACKAGE ON KNOWLEDGE AND LEVEL OF ANEMIA AMONG ADOLESCENT GIRLS AT SELECTED SETTINGS WEST BENGAL

DISSERTATION SUBMITTED TO

THE TAMIL NADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI

IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

APRIL 2014

Internal examiner :

External examiner :

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This dissertation is dedicated to my beloved father (late) Mr. Jacob Manuel who was the brainwave behind me becoming a Nurse.

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LIST OF ABREVIATIONS

ANOVA	Analysis of Variance
BMI	Body Mass Index
CDC	Centre for Disease Control
EDTA	Ethylene Diamine Tetra Acetic acid
Hb	Hemoglobin
IAP	Indian Academy of Pediatrics
ICCR	International Collaboration Centre for Research
ICMR	Indian Council of Medical Research
IERB	Institutional Ethics Review Board
LAC	Latin America and Caribbean
NA	Northern America
NFHS	National Family Health Survey
NHANES	National Health And Nutrition Examination Survey
NIN	National Institute of Nutrition
UNFPA	United Nations Framework for Population Activities
UNICEF	United Nations Integrated Children's Fund
WHO	World Health Organization
IMNCI	Integrated Management of Childhood and Neonatal Illness
ICDS	Integrated Child Development Scheme

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ABSTRACT

Effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls at selected settings, West Bengal.

Adolescent anemia is the most intractable but preventable burden in developing countries like India. **Aims and objectives**: To assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls. **Methodology:** A quasi experimental non equivalent control group design was chosen. 30 anemic adolescent girls from Kachkumrakali and Anderia of West Bengal, were selected using purposive sampling. Anthropometric measurement, hemoglobin, clinical assessment and knowledge on anemia was assessed. Nutritional intervention package including education on anemia and nutritional supplement was administered to experiment group for 27days. **Results:** Experimental group showed significant increase in the knowledge (posttest mean score 16.37 with SD 2.20) when compared to control group.(mean score 8.73 with SD 1.72. and 't' value 14.949 at $p < 0.001$ level).Similarly, there was significant increase in the level of hemoglobin with the posttest mean score of 10.66 with SD 1.19,when compared to control group,(mean score 9.40 with SD 1.28 and 't' value 3.932 at $p < 0.001$ level).There was a positive correlation ($r = 0.488$ at $p<0.006$) between the posttest knowledge score (mean=16.37 & SD = 2.20) and the posttest hemoglobin level (mean= 10.66 & SD=1.19) in the experimental group. **Conclusion:** Hence the nutritional intervention package is an effective strategy to improve knowledge on anemia and level of anemia.

Keywords: *nutritional intervention package, level of knowledge, anemia, adolescent girls*

INTRODUCTION

Adolescents are the greatest asset of any country. "Adolescence" origins from a Latin word "adolescere" which means "to grow up". Adolescence represents a critical stage of transition from childhood to adulthood. In these formative years of life, there is an abrupt and greater increase in the growth and development in various dimensions makes the adolescent girls vulnerable to various health problems. One of the major problems among adolescent girls is anemia. The iron requirement increases dramatically due to the expansion of the lean body mass, total blood volume and the onset of menstruation. This demand is further challenged by reduced dietary intake, decreased absorption, the strenuous physical work, gender disparity, lack of proper education, early marriage. Irrespective of the background, majority of the adolescent girls in India, are highly ignorant about anemia, its significant health consequences and the effects of anemia in their offspring. This further augments the vulnerability of adolescent girls to develop anemia. Anemia not only has lasting negative consequences in the adolescent

girls' growth, development, survival but also on the overall health of the children they give birth, later in life. The prevention of anemia, among adolescent girls should aim to improve their overall physical, cognitive and social dimensions of health and improved pregnancy outcomes to result in decreased incidence of pregnancy loss, neonatal mortality rate, infant mortality rate, low birth weight babies, through integrated approaches. There is a wide variety of health programmes have been commenced and being carried out at national and international level including iron and folic acid supplementation, dietary modification , dietary diversification and dietary fortification. It is essential to create awareness at the grass root level through education on adolescent health, disseminating knowledge on iron rich foods and dietary modifications with dietary diversification. Though it is a challenging task to modify the dietary behavior of adolescent girls who are in their impressionable period of life, it is possible to influence their behavior through adequate education, reinforcement on locally available dietary resources that are rich in iron, healthy cooking practices, and introduction to cheap iron fortified foods.

Objective of the study

To assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls.

Null Hypothesis of the study

NH_1 There is no significant difference in the pre test and post test level of knowledge and level of anemia between experimental and control group.

RESEARCH METHODOLOGY

The research design adopted for this study was quasi experimental, non equivalent control group design. The independent variable used in this study was Nutritional intervention package and the dependent variables used for this study were level of knowledge on anemia and level of hemoglobin of the adolescent girls with anemia. The study was conducted at Kachkumrakali and Anderia of Taldi Panchayat of south 24 paragnas district, West Bengal. The total adolescent girls in the age group of 13-19 years were 150 and 125 in Kachkumrakali and in Anderia respectively. The samples were the adolescent girls with mild, moderate and severe anemia who fulfilled the sample selection criteria. Non probability purposive sampling technique was used in

selecting the samples for this study. The intervention package prepared by the investigator was nutritional intervention package that consisted of education on management of anemia and nutritional supplement. The level of knowledge was assessed by structured knowledge questionnaire, hemoglobin measurement using clinical assessment based on modified WHO palmar pallor guidelines and photo electric colorimeter by cyanmethemoglobin method. Analysis of data was done using descriptive and inferential statistics.

RESULTS AND DISCUSSION

The present study aimed to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls.

The analysis on the post-test revealed that the majority 24(80%) of the adolescents in the experimental group had moderately adequate knowledge while 4(13.33%) had adequate knowledge and 2(6.06%) had inadequate knowledge. In the control group all of them had inadequate knowledge.

The pretest mean score for knowledge was 8.37 with S.D 1.83 and the post- test mean score was 16.37 with S.D 2.20. The calculated‘t’ value was $t = 20.087$ which was found to be statistically highly significant at $p<0.001$ level in the experimental group.

With regard to the hemoglobin level among adolescent girls in the experimental group, in the pre-test none of them had normal hemoglobin, 15(50%) had mild anemia, 12(40%) had moderate anemia and 3(10%) had severe anemia. whereas in the post-test majority 22(70%) had only mild anemia whereas, 8(26.67%) had moderate anemia and 1(3.03%) adolescent girls had normal hemoglobin none of them had severe anemia.

The pretest mean score for level of anemia was 9.47 with S.D 1.47 and the post-test mean score was 10.66 with S.D 1.19. The calculated‘t’ value was $t = 10.500$ which was statistically highly significant at $p < 0.001$ level.

The analysis of pretest and post- test hemoglobin level among adolescent girls in the control group, showed that, in the pre-test and in post-test none of them had normal hemoglobin. In the pretest alone 15(50%) had mild anemia and 14(46.67%) had

moderate anemia, 1(3.33%) had severe anemia. Similarly in the post-test 13(43.33%) adolescent girls had mild anemia, 16(53.33%) had moderate anemia and 1(3.03%) had severe anemia.

There was a significant improvement in the knowledge and level of hemoglobin after the administration of nutritional intervention package. The nutritional supplement and information on anemia was an effective interventional tool in improving the knowledge and level of anemia among adolescent girls with anemia.

CONCLUSION

The present study assessed the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls. The findings of the study revealed that there is significant improvement in the knowledge and level of anemia among adolescent girls, who received the intervention. Hence the nutritional intervention package can be utilized to prevent and treat anemia.

IMPLICATIONS

The investigator had drawn the following implications from this study which is of vital concern to the field of Nursing education, Nursing practice, Nursing administration and Nursing research. The nutritional intervention package can be incorporated into various therapeutic diets and cooking demonstration in the nutrition and cookery classes for the nursing students. Refresher courses on adolescent nutrition, adolescent health and anemia can be planned and conducted. Clinical importance of this nutritional intervention package can be incorporated into community health programs for adolescent girls with anemia. This nutritional intervention package can be incorporated in Integrated Child Developmental Scheme (ICDS). Education on the management of anemia and iron rich foods can immensely influence the dietary habits of the adolescent girls. Nurse administrators can coordinate and implement outreach programs in the schools and community to create awareness of anemia among adolescent girls. The present study serves as a basis for professional nurses, student nurses and other professionals to conduct further research on various nutritional approaches to reduce anemia among adolescent girls.

INTRODUCTION

Adolescents are the greatest asset of any country. “Adolescence” origins from a Latin word “adolescere” which means “to grow up”. Adolescence represents a critical stage of transition from childhood to adulthood. In these formative years of life, there is an abrupt and greater increase in the growth and development in various dimensions. This calls for integrated approaches to meet the assorted health needs of the adolescents in particular the adolescent girls.

In adolescent girls, the rapid biological, psycho-social, and hormonal changes are followed by sexual maturation and puberty. These changes places a greater nutritional demand especially, the iron requirements peak dramatically due to the expansion of the lean body mass, total blood volume and onset of menarche. The demand is further challenged by reduced dietary intake, the strenuous physical work, gender disparity, lack of education, early marriage and multiple child births.

Anemia among adolescent girls is the most intractable but preventable severe public health epidemic. The most common type of anemia in adolescent girls is iron deficiency anemia. Anemia affects people of both developing and developed countries globally with major consequences on health as well as on social and economic development. Anemia occurs at all stages of the life cycle, but adolescent girls are more vulnerable to develop anemia that causes problems in their growth and development, survival and health of their children they give birth, later in life.

UNICEF at the launch of Adolescent Anemia Control Programme (2011) stated that anemia in adolescent girls affects their growth and development, causes loss of appetite, reduced food intake and easy fatigability, irregular menstrual cycles, reduces physical fitness, school absenteeism, learning difficulties, and reduced future work productivity. Anemia influences the adolescent girls’ entire life cycle. Adolescent girls with lower pre-pregnancy iron stores give birth to preterm or low birth weight infants (below 2,500 grams) and may succumb to anemia while giving birth. These children born to anemic girls die within one year due to under nutrition, anemia and infections or

continue to live with such morbidity, thus perpetuating the intergenerational cycle of maternal and child under nutrition.

1.1 BACKGROUND OF THE STUDY

In adolescent girls, the rapid biological, psychosocial and cognitive changes that begin during puberty place a great demand on the nutritional requirements and make them more vulnerable to nutritional deficiencies especially anemia.

World Health Organisation (2005) stated that the global anemia prevalence estimates 30 percent affecting 468.4 million non-pregnant women. In Asia the prevalence of anemia is estimated to be 33% affecting 318.3 million which is almost two third of the world wide prevalence of anemia. The highest prevalence was among the adolescent girls.

Table 1. 1 Global and WHO member states prevalence of anemia

AREA	NON-PREGNANT WOMEN	
	Prevalence (%)	**Number affected (millions)**
Global	30.2 (28.7–31.6)	468.4 (28.7–31.6)
Africa	44.4 (40.9–47.8)	82.9 (76.5–89.4)
Asia	33 (31.3–34.7)	318.3 (302.0–334.6)
Europe	15.2 (10.5–19.9)	26.6 (18.4–34.9)
LAC*	23.5 (15.9–31.0)	33 (22.4–43.6)
NA*	7.6 (5.9–9.4)	6 (4.6–7.3)

Source: WHO Data base 2013

*Latin America and the Caribbean (LAC), Northern America (NA)

The table 1.1 depicts the prevalence of anemia among a various WHO members states.

The Third National Health and Nutrition Examination Survey (2013) stated that 7.8 million adolescent girls and women of childbearing age have anemia in the United States and among them severe anemia was found in 3.3 million females, whereas a two to three times higher prevalence of iron deficiency was found in adolescent girls. Among American adolescent girls between the age group of 12 and 15 years, the incidence of iron deficiency was 9 per cent and anemia was 2 per cent. Among

adolescent girls between the age group of 16 and 19 years, the respective values were 11 and 3 percent.

In all Member States of the South-East Asia Region, (2008) reported that more than 25% of adolescent girls are reported to be anemic; in some countries the prevalence is as high as 50%. Africa and Asia account for more than 85 per cent of the absolute anemia burden among adolescent girls.

The Indian Census (2011) report revealed that of the 109.4 million adolescent girls, 67.8 – 98.5 million adolescent girls have anemia. Nearly 22 per cent of anemic girls have mild anaemia (Hb 11.9 - to 10 gm /dL), 48.7 per cent have moderate anemia (Hb 9.9 - 7gm / dL) and 27.2 per cent have severe anaemia (Hb <7 gm / dL).

G. S. Toteja, et al (2013) conducted a study among adolescent girls and pregnant women in 16 districts of 11 states of India, that showed the overall prevalence of anemia (Hb < 12 g / dL) was 90.1%, while severe anemia (Hb < 7.0 g/dL) was 7.1%.

Prakash V Kotecha (2011) stated that India's anemia is, largely due to iron deficiency, with Bihar topping the list, with the highest anemia prevalence (78%) in children while West Bengal scored the send place in the highest prevalence of anemia (72%). The prevalence of anemia in Children, Mizoram, Goa, and Kerala are below 50%, while eight out of 26 states have anemia prevalence of more than 70%.

National Family Health Survey 2005-2006 stated that the prevalence of anemia among adolescent girls (15-19 years) in West Bengal is 62%

Arulappa et.al (2011) reported that the prevalence of anemia among adolescents in some of the West Bengal districts was (81%) that was more than double the WHO cut-off level of 40% , indicating the magnitude of the problem to be of ‘severe public health significance’.

1.2 SIGNIFICANCE AND NEED OF THE STUDY

Health of the adolescent girls is the corner stone to nurture and harness the energy to create healthy children and healthy generation. But in reality, the adolescent girls are trapped in societies that make them powerless to make essential choices in terms of education, health and nutrition. Further the ignorance of adolescent girls about anemia, its significant health consequences and the effects of anemia in their offspring augments their vulnerability to develop anemia.

Anemia is abnormally low hemoglobin level that can be called as a manifestation but not a disease in itself. Anemia is an iceberg that has a very few overt symptoms when it is mild. The medical help is sought only when the symptoms are prominent, when anemia is severe.

WHO Global Health Risks' Report (2009) states that globally, anemia affects over 800 million women of which anemia accounted for 400,000 deaths and 1.5% of the Global Disability Adjusted Life Years. This cost is disproportional borne by developing nations as 60% of the morbidity and 95% of the mortality related to iron-deficiency. South Asia and sub-Saharan Africa bear about 70% of the global mortality burden attributable to iron-deficiency anemia, the common form of anemia among adolescent girls.

There is a wide variety of health programmes at national and international level to combat anemia, such as iron and folic acid supplementation, adolescent anemia control programme, IMNCI and integrated dietary approaches. These programmes aims to improve the overall physical, cognitive and social dimensions of the adolescent girl's health, to improve pregnancy outcomes, to decrease the incidence of pregnancy loss, neonatal mortality rate, infant mortality rate and low birth weight babies. Reaching the adolescent girls at the grass root level to exterminate this public health epidemic is essential need of the hour.

Maurício S Leiteet et al., (2013) stated that anemia in adolescent girls leads to impaired cognitive and physical development, risks them for poor maternal health Maternal anemia is associated with pregnancy losses, low birth weight , prematurity and

childhood anemia. Low birth weight is associated with increased child mortality and morbidity.

Sue Rod Well stated that anemia constitutes the second most prevalent nutritional deficiency in the world. General iron balance is precarious in many places. The vulnerable life cycle periods include early childhood, adolescents, reproductive years of women from menarche to menopause and pregnancy.

The Centres for Disease Control and Prevention (2011) recommends annual anemia screening of all adolescent girls. It is worth noting that one gram of iron per day is lost by every non-menstruating adolescent girl and 0.6-2.5 grams of iron is lost per day by every menstruating adolescent girl. An average adolescent girl can lose up to 12.5-15 mg of iron per each menstruation cycle. But one might lose up to 42 grams per cycle.

Premlatha et al., (2012) stated that the attention over anemia has shifted to prepare adolescent girls to have adequate iron stores prior to conception to avoid maternal and/or infant morbidity and mortality, as pregnancy is too short a period to build iron stores to meet the needs the growing fetus.

World Health Organisation (2011) has stated that in India over 70 % of adolescent girls consumes iron less than 50% of the Recommended Daily Allowance of iron which is 60 grams/ week. Hence adolescent nutrition has to be specifically addressed, as an integrated approach comparable to the Integrated Management of Neonatal and Childhood Illness **(IMNCI)** with promotion, prevention, and treatment components. As in the IMNCI strategy for children, adolescents should be screened for anemia every year and managed at the community level.

UNICEF (2011) stated that Indians consume diet that is primarily cereal based and bioavailability of iron from such diets is limited. So it is critical to ensure that prevention of anemia through food based approaches to enhance iron intake and iron absorption thus preventing anemia among adolescent girls.

Swiss Federal Institute of Technology, Zurich, Switzerland (2008) mentioned that effective control of anemia requires multifaceted approach that includes education,

food fortification, micronutrient supplementation, dietary diversification of vulnerable groups, as well as control of diseases such as malaria and worm infestations.

Vanisha S. Nambiar and Shilpa Parnami (2007) stated that Indian diets provide mostly non-heme iron, which is very poorly absorbed (only 2-20% bioavailability). Food-based strategies advocate a diet including easily accessible and inexpensive green leafy vegetables to alleviate micronutrient deficiencies. The drumstick leaves is rich in beta carotene (~40,000µg /100g), a precursor of vitamin A. The study revealed that the freshly blanched drumstick leaves with vitamin C from lemon juice showed a positive relationship in improving anemia and a strong association between and iron absorption.

Anderson and Thankachan (2009) conducted a randomized, double- blind, controlled trial in South India with of micronized double fortified salt. The study revealed that double fortified salt was effective in reducing iron deficiency anemia in school age children.

Fredericka Meijer, UNFPA Representative of India and Bhutan (2012) reflected that "The greatest returns on investment come from investing in adolescent girls. Educated and healthy adolescent girls reach their full potential and have healthier children."

"What you are is not only what you eat but also what your mother ate"**.** Iron rich foods can meet the enormous demand of iron requirement in an adolescent girl. As the adolescent girls are in their impressionable period of life, it is crucial to influence their behaviour through adequate education, reinforcement on locally available dietary resources that are rich in iron, healthy cooking practices, and introduction to cheap iron fortified food.

The above information stated, strongly suggests a positive paradigm for an integrated approach to create awareness about anemia and its prevention among adolescent girls. In particular, education on adolescent health, disseminating knowledge on iron rich foods and dietary modifications with dietary diversification are critical. The investigator, with these supportive data, along with her clinical experience, identified

that adolescent girls are the most defenceless population to develop anemia that is primarily due to improper dietary intake, lack of knowledge regarding anemia and socio cultural taboos. Hence the investigator established that providing a comprehensive nutritional intervention package for anemia can improve the knowledge and level of anemia among adolescent girls.

1.3 STATEMENT OF THE PROBLEM

A study to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls at selected settings, West Bengal**.**

1.4. OBJECTIVES

1. To assess the frequency of anemia among adolescent girls.
2. To assess and compare the pre-test and post-test level of knowledge and level of anemia in the experimental and control group.
3. To assess the effectiveness of nutritional intervention package on knowledge and level of anemia among experimental and control group.
4. To correlate the post test level of knowledge with the level of anemia among experimental and control group.
5. To associate the selected demographic variables with mean differed score of knowledge and level of anemia among experimental group.

1.5 OPERATIONAL DEFINITIONS

1.5.1 Effectiveness

It is the outcome of knowledge and level of anemia among adolescent girls which was assessed by structured knowledge questionnaire and clinical assessment based on modified WHO palmar pallor guidelines and hemoglobin assessment by photo electric digital colorimeter.

1.5.2 Nutritional intervention package

Nutritional Intervention Package includes education on management of anemia and administration of nutritional supplement.

Education on anemia through video show and poster presentation

- **Video Show includes**
  - Introduction to general health, nutrition and anemia
  - Causes and signs and symptoms of anemia
  - Diagnosis of anemia
  - Treatment for anemia
  - Home Care management of anemia.
- **Poster on iron rich diet.**

Preparation

Administration of Tab.Albendazole 400mg in empty stomach to deworm and administration of curd 50 ml, after six hours of deworming to promote the growth of healthy bacteria in the intestines for all adolescent girls with mild, moderate and severe anemia.

Administration of nutritional supplement

- Administration of 300 ml of drumstick leave juice, with iron fortified salt and lime juice was given two hours before lunch every day for 27 days, for each adolescent girl with mild, moderate and severe anemia.

  Preparation of drumstick leave juice: Preparation included, adding of 9 kg of clean washed drumstick leaves in 9 litres of boiling water and cooking for 10 minutes, then strained. Then 2250 grams of jaggery was dissolved in this strained drumstick leaves juice and once again strained .Then 30 grams of iron fortified salt and extract from 15 lemons was dissolved in the juice when it was luke warm.
- 75 grams of boiled bengal gram dhal with iron fortified salt and lime juice was given one hour before lunch every day for 27 days for each adolescent girl with mild, moderate and severe anemia.
- **Preparation of boiled bengal gram dhal:** To prepare boiled bengal gram dhal, 2250 grams of dhal was soaked for 2 hours in water and boiled in the pressure cooker with 30 grams of iron fortified salt. Then juice of 15 lemons was added.

1.5.3 Knowledge

It is the ability of the adolescent girls to understand about anemia which was assessed by using structured knowledge questionnaire.

1.5.4 Level of anemia

It is the level of hemoglobin lesser than 12gm/dL in the venous blood, based on ICMR guidelines that were measured by photo electric digital colorimeter and clinical assessment based on modified WHO palmar pallor guidelines.

1.5.5 Adolescent girls

The girls belong to the age group of 13-19 years, who are residing at Kachkumrakali and Anderia village, West Bengal.

1.6 ASSUMPTIONS

1. Adolescent girls may have anemia.
2. The nutritional intervention package may help to improve knowledge and level of anemia among adolescent girls.
3. Increased level of knowledge on anemia may improve the dietary habits and improve the level hemoglobin.

1.7 NULL HYPOTHESES

NH_1 There is no significant difference in the pre test and post test level of knowledge and level of anemia between experimental and control group.

NH_2 There is no significant relationship between the post test levels of knowledge with level of anemia in experimental group.

NH_3 There is no significant association between the knowledge and level of anemia among adolescent girls with the mean differed score of selected demographic variables in experimental group.

1.8 DELIMITATIONS

1. The study was delimited to a period of 5 weeks.
2. The study was conducted only on unmarried adolescent girls who have attained menarche.

1.9 CONCEPTUAL FRAMEWORK

The conceptual framework was based on Wiedenbachs Helping Art of Clinical Nursing Theory.

This section explains the conceptual framework adopted for the study. A conceptual framework is a schematic representation that depicts the pathway of systematic steps, activities and outcome that directs the investigator to achieve the objectives of the study.

The conceptual framework of this study was based on Wiedenbachs helping art of Clinical Nursing Theory that was published on 1964. Ernestine Wiedenbachs proposed this theory as prescriptive theory that directs the action for a desired situation conceived to explicit the goal. The aim of this study was to improve the knowledge and level of anemia among adolescent girls. So the investigator developed a prescription that is nutritional intervention package based on this central purpose and implemented to accomplish the goals.

Wiedenbachs views for effective nursing practice the nurse should possess factual and speculative knowledge, judgement and skills. According to Wiedenbachs, Nursing practice consists of

- Identifying the need for help
- Ministering the needed help
- Validating that the need

Identifying the need for help

In identifying the need, the nurse perceives the person as consistent or inconsistent behaviour. The two components in identifying the need for help is the central purpose and general information

The Central Purpose refers to the overall goal towards which a nurse strives. It transcends the immediate intent to assign a task accomplishes the goal that is based on the nurse’s personal philosophy. In this study the central purpose was to improve the knowledge and level of anemia among adolescent girls.

General Information - The Nurse explores with the person, the meaning of his behaviour in a aim to elicit a revealing response from the person to identify the need. This means the person indicates ability or no ability to resolve the problem. When no ability is indicated the person has a need for help. In this study the investigator assessed the general information that included demographic variables, biophysical variables and the pretest knowledge. Demographic variables included age, literacy-adolescent girl, father and mother, type of family, socio economic status, birth order, number of siblings, occupation of the father, mother, income of the family, marital status of the adolescent girls, number of children for the adolescent, menstrual history and dietary habits. The biophysical variables included anthropometric assessment, hemoglobin estimation and clinical assessment. Knowledge was assessed through structured questionnaire. It revealed that adolescent girls lacked knowledge on anemia and had mild, moderate and severe anemia.

Ministering the need for help

In this step the nurse formulates a plan for meeting person's need for help based on available resources. The following components are there in ministering the need for help.

Prescription refers to plan of care, broad general and specific actions, the nature of action that is mutually agreed by the nurse and the person, to fulfil the central purpose. In this study the investigator's prescription was education on anemia and nutritional supplement to improve the knowledge and level of anemia among adolescent girls.

Ministering implies to the implementation of planned actions through nursing care plan. In this study the investigator gave Education on anemia and nutritional supplement to improve the knowledge and level of anemia among adolescent girls.

- **Education on anemia was administered through video show and poster presentation**

A Video Show was shown in the aspects of introduction to general health, nutrition and anemia, Causes and signs and symptoms of anemia, Diagnosis of anemia,

Treatment for anemia, Home Care management of anemia and poster-was projected on iron rich diet.

- **Administration of nutritional supplement**

The investigator administered Tab.Albendazole 400mg in empty stomach to deworm and administration of curd 50 ml, for all adolescent girls in the experimental group. Followed by this 300 ml of drumstick leave juice, with iron fortified salt and lime juice was administered two hours before lunch every day for 27 days. 75 Gms of boiled Bengal gram dhal with iron fortified salt and lime juice was given one hour before lunch every day for 27 days for each adolescent girl.

Realities refer to the physical, emotional and spiritual factors that come into play in a situation that involves nursing actions. This consists of the following components.

Agent is the participating nurse or a designer who has the personal attributes, capabilities, commitment and competence to provide nursing care and who directs all action towards the goal. In this study the agent is the researcher.

The recipient is the patient who has personal attributes, problems, capabilities, aspiration and abilities to cope. The recipient is the one who receives a nurse's action or on whose behalf actions are taken. The recipient is vulnerable and dependent. In this study the recipients are the adolescent girls with anemia.

The goal is the nurses desired outcome, it directs action and suggests the reason for taking those actions. In this study the goal was to improve the knowledge and level of anemia among adolescent girls.

The means are the activities and devices used by the nurse to achieve the goal. The means in this study was nutritional intervention package

Framework refers to the facilities in which nursing is practiced, it comprises of human, environmental, professional and organisational aspects of care. In this study the framework refers to the adolescent girls from Kachkumrakali and Anderia of Taldi Panchayat, West Bengal.

Validating the needed help

It refers to the validation of evidence that shows a person's needs have been met and the central purpose is achieved. This step includes the post assessment after ministering the help to compare and infer the outcome. This enables the researcher to decide the recommended action to continue, quit or modify the nursing action. In this study the effectiveness of nutritional intervention package on the knowledge and level of anemia among adolescent girls was assessed for knowledge, using standard knowledge questionnaire. For biophysical variables, anthropometric assessment, hemoglobin estimation and clinical assessment based on modified WHO palmar pallor scale.

Reassessment - Investigator recommended reassessment when there was no improvement in the level of knowledge and level of hemoglobin.

Reinforcement – Investigator reinforced when there was enhancement in the level of knowledge and level of hemoglobin. The enhancement of the intervention is recommended.

The investigator identified that the nutritional intervention package was effective in improving the knowledge and hemoglobin level among adolescent girls.

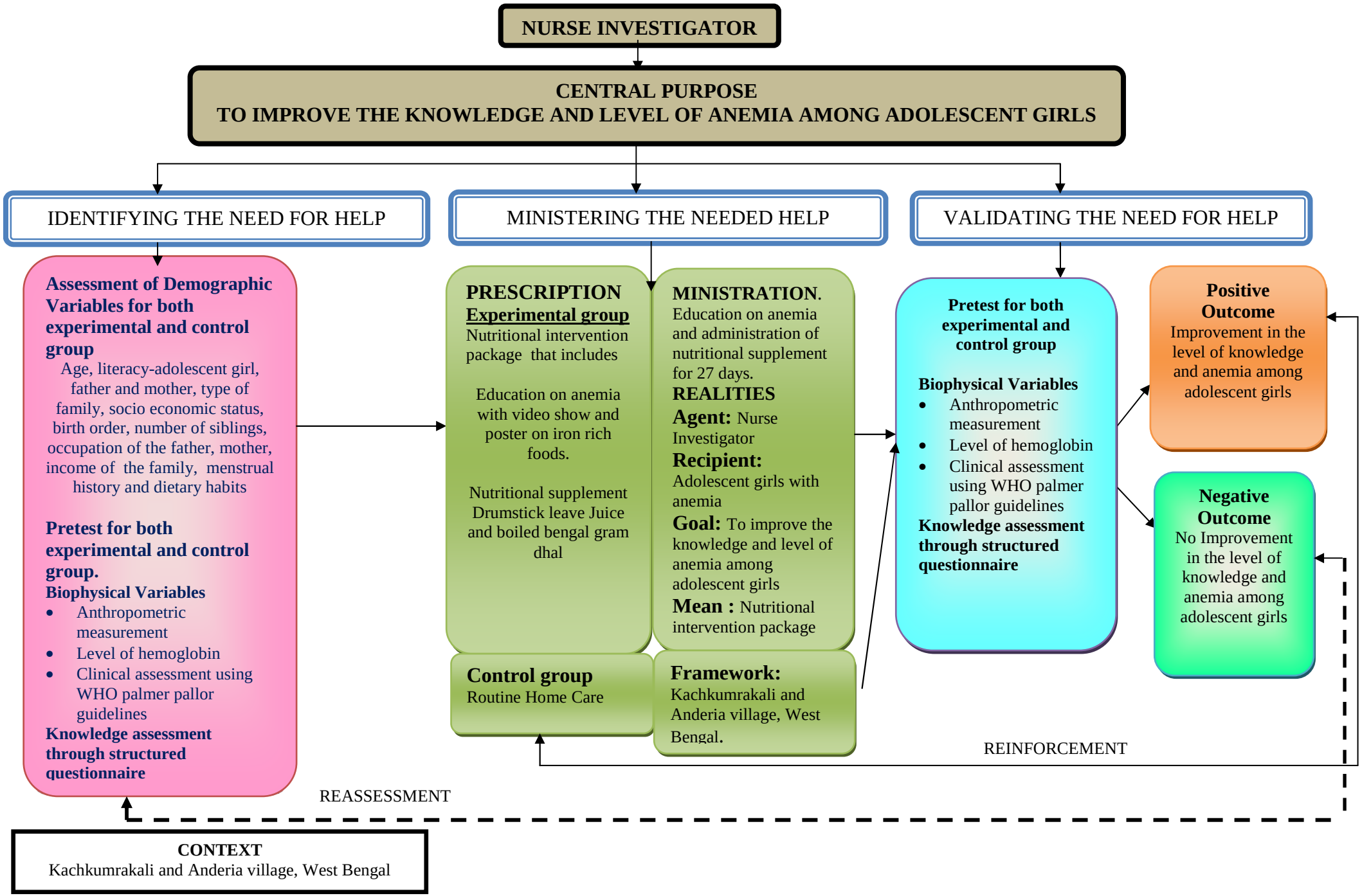


FIG 1: CONCEPTUAL FRAMEWORK BASED ON WIEDENBACH'S HELPING ART CLINICAL NURSING AND PRESCRIPTIVE THEORY (1970).

1.10 OUTLINE OF THE REPORT

CHAPTER I **:** Deals with the back ground of the study, need for the study, statement of the problem, objectives, operational definitions, null hypotheses, assumptions, delimitations and conceptual frame work.

CHAPTER II **:** Focuses on review of literature related to the present study.

CHAPTER III **:** Enumerates the methodology of the study.

CHAPTER IV **:** Presents the data analysis and data interpretation.

CHAPTER V **:** Deals with the discussion of the study

CHAPTER VI **:** Gives the summary, conclusion, implications, recommendations and limitations of the study.

The study report ends with selected References and Appendices.

REVIEW OF LITERATURE

Polit and Beck (2008), stated that review of literature is a systematic search of a published work to gain information about a research topic. The literature review, not only involves searching, surveying and evaluation of the relevant literature but also describing, synthesizing and assimilating the information into a summary, critically analyzing the facts gathered methodologically to identify areas of controversy and formulate questions for further research, and presenting it in a discursive organized prose.

Hence the investigator intended to establish a platform for the study by an intensive survey of relevant data base from the seminal works performed by scholars to expand a deeper insight into the research problem, related theories, hypothesis, and appropriate methodology to establish the appropriateness of the current study with the previous studies, as well as to implement and disseminate significant practices to combat anemia among adolescent girls.

This chapter enumerates the related literature from both research and non-research materials in the following sections.

SECTION 2.1: Scientific reviews related to anemia among adolescent girls.

SECTION 2.2: Scientific reviews related to causes of anemia

SECTION 2.3: Scientific reviews related to signs and symptoms and diagnosis of anemia

SECTION 2.4: Scientific reviews related to treatment of anemia

SECTION 2.5: Scientific reviews related to complications of anemia

SECTION 2.6: Scientific reviews related to effectiveness of educational program on knowledge of anemia

SECTION 2.1: SCIENTIFIC REVIEWS RELATED TO ANEMIA AMONG ADOLESCENT GIRLS.

Premalatha, et al., (2012), conducted a cross sectional survey among 400 adolescent school girls of 13-17 years at Chennai, to study the prevalence and risk factors of anemia among adolescent girls. Anthropometric and hemoglobin by cyan method were obtained. The results revealed that anemia was prevalent among 78.75% of the adolescent girls. There was significant association of anemia with the socioeconomic profile and dietary habits. The study recommended kitchen gardens, iron rich foods and iron fortification should be considered to prevent and treat anemia.

Gupta S et al., (2012) conducted a comparative study between rural and urban school children (n= 172) in the age group of 6-16 years of age at Midnapore, West Bengal to assess the nutritional status and prevalence of anemia. Height, weight and hemoglobin were measured. The overall prevalence of anemia was 80.2% with no significant difference between the gender as well as the rural (83.7%) and urban (76.7%) children. High prevalence of thinness was observed in urban area (48.8% versus 41.9%), while severe thinness was high among rural children (18.5% versus 13.9%).There was no significant difference between the prevalence of anemia and normal nutritional status between urban and rural children.

Nader Soleimani, Naser Abbaszadeh (2011) conducted a cross sectional survey with a purpose to study the relationship between anemia and academic achievement among 46 high school adolescent girls in Garmsar city, Iran. Serum ferritin, serum iron, mean corpuscular volume, mean cell hemoglobin and hemoglobin were measured. The study revealed that there was a significant positive relationship between some hematological indices (Ferritin, Serum Iron, MCV, MCH, HCT, Hb) and academic achievement. The study concluded that anemia is more prevalent among Iranian female students that might affect their learning and educational achievement adversely.

KP Baral1 and SR Onto (2009) conducted a cross sectional study among adolescents of 10-19 years to assess the prevalence of anemia in rural and urban areas of Morang District, and Biratnagar Sub-Metropolitan town,Nepal. From a total of 308 adolescents, 127 from urban and 181 rural, 151 males and 157 females were selected for the study. Hemoglobin was estimated using Sahli method. The study concluded that the

adolescent girls had the highest prevalence of anemia 78.3%, while the adolescent boys had 52.3% of anemia.

SECTION 2.2: SCIENTIFIC REVIEWS RELATED TO CAUSES OF ANEMIA

Shoshanna Revel-Vilk, et al., (2012), conducted a quasi experimental study among 105 adolescent girls with menorrhagia. In the total of 105 adolescent girls who reported heavy periods, 94 filled the initial anonymous questionnaire followed by a more comprehensive detailed bleeding questionnaire and a pictorial blood assessment chart. Among the 94 girls who completed the full questionnaire, 34 reported menorrhagia (36%; 95% CI, 26.5%-46.7%). Hemoglobin levels were assessed among the 62 girls, revealed 6 had anemia (9.6%) and all of them had menorrhagia Almost one-third (11 of 34) of these girls did not perceive having menorrhagia according to their response to the initial questionnaire. The study concluded that adolescents with menorrhagia were at the risk of developing anemia.

Ursula Viana Bagni, et al. , (2010), conducted a cross sectional study among 707 adolescents in Brazil to study the prevalence of anemia and association of overweight , excessive body fat and sexual maturation. Hemoglobin, BMI and Body fat was determined by bioelectrical impedance. The sexual maturation was assessed by breast or genitalia development and pubic hair development. Among adolescents the prevalence of anemia was 22.8% with the higher rate among adolescent girls compared to adolescent boys. Overweight girls had lower hemoglobin levels compared to those who were not overweight ($p< 0.01$). The study concluded that overweight plays a role in reduction of hemoglobin levels among adolescent girls.

Leenstra, et al., (2009) conducted a cross sectional survey using random sampling, among 648 adolescent school girls in the age group of 12-18 years, from western Kenya. The prevalence, severity and risk factors associated with anemia were assessed and blood for hemoglobin, serum ferritin, peripheral smear and data for risk factors were collected. 21.1% of the adolescent girls had anemia (Hb<12gm/dL) and only one girl had severe anemia (Hb < 7gm/dL).Iron deficiency was prevalent in 19.8% of the girls. Among the anemic adolescents 30.4% were iron deficient. The study found that the major risk of adolescent girls of 12-13 yrs developing anemia was due to malaria

and schistosomiasis (snail fever), while heavy menstruation was the principal risk factor in older girls.

Duclaux Larax.R and Lachaux (2009) reported a case of a 15 year old adolescent girl who presented with symptoms of Helicobacter pylori gastritis that was confirmed with endoscopy treatment. She presented with recurrent bouts of anemia. Then she was treated with medicines for Helicobacter Pylori infection and iron supplementation that corrected the anemia successfully. The case study concluded that Helicobacter Pylori infection is a frequent cause of refractory anemia but often missed in the diagnosis.

SECTION 2.3: SCIENTIFIC REVIEWS RELATED TO SIGNS AND SYMPTOMS AND DIAGNOSIS OF ANEMIA

Sayeed Unisa et al., (2010) conducted a community based study among 559 unmarried adolescent girls using systemic sampling to evaluate the value of four clinical indicators, low cost estimation of hemoglobin in 5 districts of West Bengal. From each districts one village with high prevalence of anemia (> 40 percent) and one village with low prevalence (≤ 40 percent) were selected. The diagnosis anemia was based on self reported symptoms, clinical indicators and level of haemoglobin. The prevalence of anemia was 94% (mild anemia 45%, moderate anemia 49% and severe anemia < 1%).There was higher level of sensitivity ranging from pallor of the palms 53% to pallor of the eyelids 91%, while the specificity for palm, tongue and nail is ranging between 80-65% and eyelid 29 %. The study concluded that clinical indicators of pallor are useful to diagnose anemia against cyan method.

Soliman Ashraf, et al., (2009), conducted a comparative study among 40 children of aged 17.2+/- 12.4 months with iron deficiency anemia with 40 healthy normal age matched children to assess the linear growth in relation to their hematological parameters. Weight, height and head circumference, hemoglobin, hematocrit, MCV and MCH were measured. Based on these growth length standard deviation score (LSDS), growth velocity standard deviation score (GVSDS) and body mass index (BMI) were calculated. Iron syrup or drops with the dosage of 6 g/kg/day was given for six months. The growth parameters significantly increased after the treatment. There was a significant correlation between the serum ferritin concentration (r 0.48, $p < 0.001$) and

BMI (r 0.32, $p < 0.1$). The study concluded that iron deficiency anemia significantly impairs the growth in children.

SECTION 2.4: SCIENTIFIC REVIEWS RELATED TO TREATMENT OF ANEMIA

Joshi M, Gumashta R (2013) conducted a randomized control in adolescent girls with iron deficiency anemia, at Maharashtra to evaluate the effectiveness, adverse drug reaction and compliance level of adolescent girls in regard to the weekly iron folic acid supplementation versus daily iron supplementation for anemia among adolescent girls with the mean age of 13.48-13.55 years by using block randomization. Initial estimation of hemoglobin levels showed anemia in 120 adolescents with the mean hemoglobin of 10.1±1.1 gm/dl. All the adolescent girls were administered Tab.Albendazole 400 mg and health education on anemia. One group received daily Iron and Folic Acid supplementation while the other group received weekly Iron and Folic Acid supplementation for 3 months. The mean improvement in the hemoglobin in both the study groups was almost equal i.e. 1.0±0.7 gm/dl and 1.0±0.8 gm/dl. Abdominal pain was the most reported adverse drug reaction. The study concluded that the weekly supplementation of iron and folic acid in anemia is more promising than daily regimen with less adverse reactions and better treatment compliance.

Gayatri Priyal, et al., (2013) conducted a true experimental study among adolescent girls to assess the effectiveness of beet root juice on hemoglobin among adolescent girls at Chennai. 30 girls for the experimental and 30 girls for the control group were selected by using simple random sampling technique. The freshly prepared beetroot juice was administered to the samples for 20 days in mid morning. Pre and post assessment was done using the checklist for assessing the signs and symptoms of anemia and cyanmethemoglobin method for checking hemoglobin level. Samples in the experimental group showed a highly significant improvement in hemoglobin level following the administration of beetroot juice ($p<0.001$), in comparison with the control group. The study concluded that educating the community to use locally available resources to prevent anemia can be prevented among the adolescent girls and to prevent the complications caused by anemia.

Nambiar, Paramani and Guin (2010) conducted a quasi experimental study to assess the effect of drumstick leaves and vitamin C supplementation on hematological indices of 700 adolescent girls between the age of 16-21 years from the faculty of Family and community sciences of Vadodara, Gujarat. 100 girls were selected with positive findings in pallor assessment. The demographic data, height, weight and BMI was assessed followed by collection of blood for hemoglobin, hematocrit, packed cell volume, mean corpuscular volume and red cell morphology. The girls were divided into 3 groups, one group (Group A-21 girls), received freshly blanched drumstick leaves with boiled mung/desi chana /kabuli chana with 2 ml of lime juice, Second group (Group B n= 20) received blanched drumstick leaves in with boiled mung/desi chana / kabuli chana. Group C (n=20) received boiled mung/desi chana /kabuli chana without drumstick leave juice, for a period of 45 days during lunch hour. Hematological indices were assessed after 45 days and after 3 months. The study revealed that prevalence of anemia exists (54%) among adolescents of the middle and high income groups of urban Vadodara. The prevalence of anemia in group A reduced by 28.6%,in Group B 5% and in Group C 4.7 %. It showed a strong association between vitamin C and iron, as well as a causal association between Vitamin A from drumstick leaves and iron metabolism.

Akota K Osei, et al., (2010) conducted a placebo controlled, cluster randomized study among 499 school children of 6-10 years of Himalayan Villages of India to assess the effectiveness of micronutrient fortification of meals cooked and fortified at school on anemia. Micronutrient premix had 10 mg of iron, 375 mg vitamin A, 4.2 mg zinc, 225 mg folic acid, and 1.35 mg vitamin B-12 for each child per day Blood was collected for hemoglobin, ferritin, retinol, zinc, folate and vitamin B 12. The prevalence of anemia was 37%, iron deficiency anemia 10% and 24% of the children had low serum ferritin level, retinol (56%), Zinc (74%), folate (68%) and Vitamin B-12(17%) serum After deworming each group received either multiple micronutrients or placebo for 8 months. The study revealed that anemia, iron status, serum retinol and folate levels had improved in the treatment group. Hence the fortification with multiple micronutrient premix can be included in the midday meal programme.

SECTION 2.5: SCIENTIFIC REVIEWS RELATED TO COMPLICATIONS OF ANEMIA

Chen MH et al., (2013) conducted a nationwide population based study to determine the association between psychiatric disorders and iron deficiency anemia among children and adolescent. The National Health Insurance Database from 1996 to 2008 was utilized to group 2957 the children and adolescents with iron deficiency anemia to compare them with the specific age and gender-matched controls (1:4) to investigate the increased risk of psychiatric disorders. Among the total of 2957 adolescents with iron deficiency anemia, there was increased risk of bipolar disorder as well a low risk of other mood disorders, autism spectrum disorder, attention deficit hyperactivity disorder, and developmental disorders were identified. The study concluded that there is an increased risk of psychiatric disorders in patients with IDA and the exact mechanism is yet to be cleared.

Norma B Lerner & Richard Sills (2009) conducted a retrospective study among school children (10-12 yrs) to assess the possible relationship between anemia and physical growth. Children were divided into two groups according to gender. Hemoglobin, Mean Corpuscular Volume, serum ferritin and body mass index (BMI) were assessed. The standard deviation scores for height were calculated. In both groups irrespective of the cause they had reduced anthropometric measurements, decreased ferritin levels with microcytic hypochromic anemia. There were significant relationship between the anthropometric measures and the various causes of anemia ($p<0\cdot05$) (ANOVA). The study concluded that anemia plays an important role in influencing the physical growth in children.

Stolz Erwin et al., (2007) conducted a prospective study in 121 clients with cerebral venous thrombosis and 120 healthy clients in control group .Total blood count and blood for coagulation profile were compared. The female hemoglobin level less than 12gm /dl in males < 13gm/dl were considered to be anemic. The calculated odds ratio values were calculated based on a logistic regression model and the level of significance of $p \leq 0.2$. The study concluded that there is a significant and independent association between cerebral venous thrombosis with severe anemia

SECTION 2.6: SCIENTIFIC REVIEWS RELATED TO EFFECTIVENESS OF EDUCATIONAL PROGRAM ON ANEMIA

Dongre and Deshmukh (2011) conducted a Participatory Action Research among adolescent girls in 23 villages Anji, in Wardha District of Maharashtra. Hemoglobin colour scale was used to assess the hemoglobin. Iron folic acid tablets and liquid iron prophylaxis was given for a period of 100 days in a year through community participation. Education was given on iron rich foods and on iron supplementation. The results showed that there was a significant reduction in the nutritional anemia from 73.8% to 54.6% among the adolescent girls. The study concluded that once-weekly iron supplementation and nutritional education, improved the hemoglobin status of the unmarried rural adolescent girls.

Manjeet Kaur et al., (2011) conducted a true experimental study among 50 medical students in the age group of 17-19 years, Amritsar to assess the impact of nutritional education in reducing iron deficiency anemia in adolescents. Hematological indices were done to assess their iron status at baseline, and follow up study after 12 months. It was found that 62% of girl students had mild anemia (Hb>12gm/dl), and 14% of them had anemia of moderate degree (Hb>12gm/dl) at baseline. The adolescent girls were then given education on iron deficiency anemia. The results showed that there was a significant improvement in the hematological indices in the follow up study after 12 months. The study concluded that nutrition education is one of the appropriate, effective and sustainable approach to correct and prevent iron deficiency anemia.

Alaofe et al., (2009) conducted a quasi experimental study to assess the effectiveness of nutrition education for 4 weeks and increasing the bioavailability of dietary iron content for 22 weeks among 68 school children between 12-17 years in Benin. Two schools were selected one for experimental group and one for control group. Nutrition knowledge questionnaire, 24 hours recall, anthropometric measurements, iron status indicators, malaria screening and screening for parasitic infection. The results revealed that in the interventional group there was a significant increase in the knowledge scores, mean intake of dietary iron, and vitamin C .There was significant increase in the mean hemoglobin level and serum ferritin level in the experimental and control group.The study concluded that the education and multidimensional dietary approach plays a role in reducing anemia among adolescent girls.

RESEARCH METHODOLOGY

Polit and Beck (2008) stated that research methodology involves the steps, procedure and strategies for gathering and analysing data in a study. Research Methodology is the systematic, theoretical analysis of the methods applied to a field of study that gives a clear cut idea on what the researcher is carrying out his or her research.

This chapter depicts the methodology adopted for this study that includes the research design, variables, setting, population, sample, criteria for selection of the sample, sample size, sampling technique, development and description of the tool, content validity, reliability of the tool , pilot study, data collection procedure and plan for data analysis.

3.1 RESEARCH APPROACH

Quantitative research approach was used for the study**.**

3.2 RESEARCH DESIGN

The research design adopted for this study was quasi experimental, non equivalent control group design. According to **Polit and Beck (2011)** the design is quasi experimental, as the investigator incorporated an intervention with control group but no randomization was used as availability of the sample size was limited.

GROUP	**PRE-TEST** **(O_1)**	**INTERVENTION** **(X)**	**POST TEST** **(O_2)**
Experimental group	Assessment of pre test level of hemoglobin, and knowledge on anemia among adolescent girls with anemia. .	Administration of Nutritional Intervention Package for the adolescent girls with anemia	Assessment of post test level of hemoglobin, and knowledge on adolescent girls with anemia.
Control Group	Assessment of pre test level of hemoglobin, and knowledge on anemia among adolescent girls with anemia..	Routine Home care	Assessment of post test level of hemoglobin, and knowledge on adolescent girls with anemia.

3.3 VARIABLES

3.3.1 Independent Variable

Nutritional intervention package was the independent variable used in this present study.

3.3.2 Dependent Variables

The level of knowledge on anemia and level of hemoglobin of adolescent girls with anemia were the dependent variables used for this study.

3.3.3 Extraneous Variables

The extraneous variables in the present study were age of the adolescent girl, literacy of the adolescent girl, literacy of the father and mother of the adolescent girl, type of family, socio economic status, birth order, number of siblings, occupation of the father, occupation of mother, income of the family, menstrual history, dietary habits, height, weight and BMI.

3.4 SETTING OF THE STUDY

The study was conducted in Kachkumrakali and Anderia of Taldi Panchayat of south 24 paragnas district, West Bengal. The total adolescent girls of age group 13-19 years were 150 and 125 in Kachkumrakali and in Anderia respectively.

3.5 POPULATION

3.5.1 Target Population

The target population includes all the adolescent girls in the age group of 13-19 years residing at Kachkumrakali and Anderia.

3.5.2 Accessible population

All the adolescent girls in the age group of 13-19 years with mild, moderate and severe anemia at Kachkumrakali and Anderia village of Taldi Panchayat , West Bengal.

3.6 SAMPLE

The adolescent girls with mild, moderate and severe anemia who fulfilled the sample selection criteria.

3.7 SAMPLE SIZE

The study comprised of 60 adolescent girls with mild, moderate and severe anemia who fulfilled the sample selection criteria. Among 60 adolescent girls 30 were in experimental group and 30 in control group.

3.8 CRITERIA FOR SAMPLE SELECTION

3.8.1 Inclusion criteria

1. Adolescent girls in the age group of 13-19 years with mild, moderate, and severe anemia.
2. Adolescent girls who are willing to participate in the study.
3. Adolescent girls who accept to consume the nutritional supplement everyday for 27 days.
4. Adolescent girls who can understand Bangla or English.
5. Adolescent girls who are present at the time of data collection

3.8.2 Exclusion criteria

1. Adolescent girls who are on iron supplements
2. Adolescent girls who has any other hematological disorders
3. Adolescent girls who are married
4. Adolescent girls who have not attained menarche.
5. Adolescents girls who had deworming treatment within 3 months.

3.9 SAMPLING TECHNIQUE

Non probability purposive sampling technique was used in selecting the samples for the study.

3.10 DEVELOPMENTAL AND DESCRIPTION OF TOOL

After an extensive review of literature and discussion with experts and with the investigator’s professional experience, the level of anemia was assessed by clinical assessment based on modified WHO palmar pallor guidelines, hemoglobin estimation by photo electric digital colorimeter and knowledge on anemia by structured knowledge questionnaire.

3.10.1 PART.A DATA COLLECTION TOOL

3.10.2 PART.B INTERVENTIONAL TOOL

3.10.1 PART.A

SECTION 1: DEMOGRAPHIC VARIABLES

It consisted of age, literacy-adolescent girl, father and mother, type of family, socio economic status, birth order, number of siblings, occupation of the father, occupation of mother, income of the family, marital status of the adolescent girls, number of children, menstrual history, health history, and dietary habits.

SECTION 2: BIO PHYSICAL VARIABLES

1. Anthropometric Measurements: Height, Weight, BMI.

Height: The adolescent girls were asked to stand against the manual stadiometer that was fixed on the wall. The headpiece was kept onto the upper most (superior) point on the head with sufficient pressure to compress the hair. Then the height was noted and recorded.

Weight: The adolescent girls were asked to step up backwards onto the standard portable weighing scale and stand still over the centre of the scale with body weight evenly distributed between both feet. The adolescent girls arms hanging freely by the sides of the body, with palms facing the thighs and hold her head up, and face forward. Then the weight was measured to the nearest fraction and recorded.

According to ICMR –modified mean weight and height for adolescent girls between 13-19 years.

AGE OF THE ADOLESCENT GIRL	MEAN HEIGHT(CM)	MEAN WEIGHT (KG)
13-15 YRS	147	38
16-17 YRS	149	39
18-19YRS	152	41

Scoring key for height and weight

Score	Interpretation (weight)	Interpretation (height)
>75 %	Adequate mean weight	Adequate mean height
51-75%	Moderately adequate mean weight	Moderately adequate mean height
< 51 %	Inadequate mean weight	Inadequate mean height

2. Level of hemoglobin by using cyanmethemoglobin method with photo electric colorimeter

Photo electric colorimeter is used to determine hemoglobin concentration. It has LCD display for direct hemoglobin results, auto calibration, auto zero facility and standard memory facility. With the minimum sample of 1 ml, the measurement of hemoglobin concentration is carried out using latest LED technology, the green light produced is projected through the sample and measured by sensitive photo diode. The measurements are made using cyanmethemoglobin method, the most preferred and the most accurate method for determining the hemoglobin concentration.

Procedure

1. The nurse Investigator explained the procedure in Bangla / English.
2. Obtained informed consent.
3. The site was cleaned with alcohol swab and fresh venous blood 1ml was collected into the EDTA vial. It was mixed well and incubated at room temperature for 5 minutes.
4. From that 20 micro litre of blood is drawn through pipette and added in 5 ml of drabkin's solution in a test tube.
5. It was tested in photoelectric colorimeter and documented by the certified lab technician.

Level anemia was calculated based on ICMR hemoglobin scale for adolescent girls aged 13-19 years.

1. Normal Hb levels : 12.0–14 g/dL
2. Mild anemia : 10.0–11.9 g/dL
3. Moderate anemia : 7.0–9.9g/dL
4. Severe anemia : < 7.0 g/dL
5. Very severe Anemia : < 4.0 g/dL

3. Clinical Assessment based on modified WHO palmer pallor guidelines

It consisted of 6 signs, if any one sign is present the score was '1' and if it is not present the score was given '0'

1. Scanty hair
2. Pallor
3. Pale conjunctiva
4. Pale Lips
5. Koilonychias
6. Pale nails

SECTION 3.KNOWLEDGE QUESTIONNAIRE

It consisted of structured knowledge questionnaire to assess the level of knowledge on anemia with the following components

- Introduction to general health, nutrition and anemia (10 questions)
- Causes, signs and symptoms and Diagnosis (5 questions)
- Treatment and complications (5 questions)
- Home Care management of anemia. (5 questions)

Scoring key

Each item was a closed ended multiple choice questions with single correct answer. Each correct response was awarded with a score of '1' mark and the wrong question was awarded with a score of '0' marks. Total score was 25. Maximum score was 25 and minimum score was '0'.

Score	Interpretation
>75 %	Adequate knowledge
51-75%	Moderately adequate knowledge
≤50 %	Inadequate knowledge

PART B:

SECTION 1: EDUCATION ON ANEMIA WAS ADMINISTERED THROUGH VIDEO SHOW AND POSTER PRESENTATION

- **Video Show included the aspects of**
  - Introduction to general health, nutrition and anemia
  - Causes and signs and symptoms of anemia
  - Diagnosis of anemia
  - Treatment of anemia
  - Home Care management of anemia.
- **Poster-was projected on iron rich diet.**

SECTION 2.ADMINISTARTION OF NUTRITIONAL SUPPLEMENT

- **Administration of Tab.Albendazole 400mg** in empty stomach to deworm and administration of curd 50 ml, after six hours of deworming to promote the growth of healthy bacteria in the intestines for all adolescent girls with mild, moderate and severe anemia.
- **Administration of 300 ml of drumstick leave juice,** with iron fortified salt and lime juice was given two hours before lunch every day for 27 days, for each adolescent girl with mild, moderate and severe anemia.

  Preparation of drumstick leave Juice: Preparation included, adding of 9 kg of clean washed drumstick leaves in 9 litres of boiling water and cooking for 10 minutes, then strained. Then 2250 Gms of jaggery was dissolved in this strained drumstick leaves juice and once again strained .Then 30 Gms of iron fortified salt and extract from 15 lemons was dissolved in the juice when it was luke warm. 300 ml of this juice was given to each adolescent girl with anemia 2 hours before lunch.
- **Administration of 75 gms of boiled bengal gram dhal** with iron fortified salt and lime juice was given one hour before lunch every day for 27 days for each adolescent girl with mild, moderate and severe anemia.

  Preparation of boiled bengal gram dhal: To prepare boiled bengal gram dhal, 2250 Gms of dhal was soaked for 2 hours in water and boiled with 30 grams of iron fortified salt in the pressure cooker. Then juice of 15 lemons was added.

Nutritional Information of Nutritional supplement

Food Item	Iron (mg)	Protein (gm)	Vitamin C(mg)	Beta Carotene	Calcium (mg)
Drumstick leave	2.55	20.1	660	59070	1320
Bengal gram dhal	3.975	15.6	0	96.75	42
Jaggery 75 gm	1.98	0.3	0	60	80
Lemon Juice	0.6	1.5	63	15	90
Iron fortified salt	1.6	0	0	0	0
Total	**10.705**	**37.5**	**723**	**59241.75**	**1532**

3.11 CONTENT VALIDITY

The content validity of the data collection and intervention tool was obtained from the experts' opinion in the following field of expertise.

Pediatric Hemato Oncologist - 1

Pediatrician - 1

Nutritionist - 1

Physician - 1

Nursing expert - 3

Modifications were made as per the expert's suggestions and incorporated in the tool.

3.12 ETHICAL CONSIDERATION

The research study was approved in Institutional Ethics Review Board (IERB) held on December '2012 by the International Collaboration Centre for Research (ICCR), Omayal Achi College of Nursing, and Chennai. The ethical principles followed in the study were,

I. Beneficence

1. **Freedom from harm and discomfort**

Participants were subjected to minimal risk (withdrawn 1ml of peripheral blood for checking hemoglobin level) with their consent during the study period.

2. Protection from exploitation

Participants were assured that their involvement or information provided by them will not be used against them; investigator completely explained the procedure and motivated the participants to continue the study.

II. Respect for human dignity

1. The Right to Self determination

Participants were given full rights to ask question and can also withdraw from the study.

2. The Right to Full disclosure

The investigator has fully explained the nature of the study, the person's right to refuse or participate in the study.

An informed consent was obtained from the parents and assent from the study participants before the study.

III. Justice

The investigator selected the study participants completely based on the study requirements and maintained privacy throughout the study.

1. Right to Fair Treatment

The investigator selected the study participants based on the inclusion and exclusion criteria and assigned them into study and control group.

2. Right to Privacy

The investigator maintained the participant's privacy through confidentiality pledge and informed consent throughout the study.

IV. Confidentiality

The investigator maintained confidentiality of the data provided by the study participants through individual coding for each participant.

3.13 RELIABILITY

The reliability of the tool was established by test retest method for knowledge questionnaire. The score obtained was r = 0.97 which was calculated by using Karl

Pearson's Correlation Coefficient method. The 'r' value indicated that the tool shows positive correlation. Hence the tool was considered highly reliable for proceeding with the main study.

The reliability of the photo electric colorimeter was done through interrater method. 1ml of venous blood was collected in EDTA vial from 3 adolescent girls for assessment of hemoglobin level both in calorimeter and at Canning Laboratory. The results was found to be reliable r = 0.96. Hence the photo electric colorimeter for checking hemoglobin was considered highly reliable for proceeding with the main study.

3.14 PILOT STUDY

The study was conducted at Boyersing and Uttar Taldi of Taldi Panchayat, South 24 paragnas district of West Bengal, after getting formal permission from the Principal, Omayal Achi College of Nursing, ethical clearance from International Centre for Collaborative Research and permission from Panchayat Pradhan of Taldi Panchayat, West Bengal.

Self introduction about the investigator and information regarding the nature of the study was explained to the selected adolescent girls' parents and adolescent girls to gain co-operation in the procedure of data collection. Privacy and confidentiality was maintained during the process of data collection. A written consent was obtained from the selected adolescent girl's parents and assent from the adolescent girls.Based on the inclusion and exclusion criteria, the investigator selected 10 adolescent girls from Boyersing as experimental group and 10 adolescent girls from Uttar Taldi as control group. The sampling technique used was non- probability purposive sampling technique.

The required materials such as weighing machine, measuring tape, knowledge questionnaire, printed materials, pencils, papers and the photo electric colorimeter with reagents to check hemoglobin was kept ready for data collection.

Data collection was done at different timings for the study group and control group on the same day by the investigator.The Adolescent girls were gathered in a school permitted by the village authorities. The investigator with the certified lab technician checked the hemoglobin levels of the adolescent girls with photo electric colorimeter and

reports were documented. The adolescent girls with mild, moderate, and severe anemia were grouped together, then clinical assessment was carried out separately by the investigator and another qualified nurse, using modified WHO palmar pallor guidelines and the findings were documented.

Then, Tab.Albendazole 400mg was administered to all anemic adolescent girls in empty stomach, followed by 50 ml of curd was administered after six hours to deworm and to promote the growth of healthy bacteria. The next day all the adolescent girls with anemia were gathered in the same place and the investigator imparted knowledge through video show explanation in the aspects of general health and nutrition, definition of anemia, causes, signs and symptoms, diagnosis, treatment and prevention of anemia. and portrayed poster on iron rich diet.

From the second day through the 8^{th} day the investigator along with the adolescent girls of experimental group, prepared the drumstick leaf juice and boiled bengal gram dhal for the required day. Preparation included, adding of 3 kg of clean washed drumstick leaves in 3 litres of boiling water and cooking for 10 minutes, then strained. Then 750 Gms of jaggery was dissolved in this strained drumstick leaves juice and once again strained .Then 10 gms of iron fortified salt and extract from 5 lemons was dissolved in the juice when it was luke warm. 300 ml of this juice was given to each adolescent girl with anemia 2 hours before lunch. To prepare boiled bengal gram dhal, 750 gms of dhal was soaked for 2 hours in water and boiled with 10 grams of iron fortified salt in the pressure cooker. Then juice of 5 lemons added. 75 gms of dhal was given to each adolescent girl with anemia one hour before lunch as a supplement of protein. These above preparation were given for 7 days for adolescent girls with mild, moderate, severe anemia. On the 8^{th} day post test for hemoglobin, clinical assessment, biophysical assessment and knowledge on anemia was assessed.

The findings of the pilot study gave the evidence that the tool was reliable, feasible and practicable to conduct the main study.

3.15 PROCEDURE FOR DATA COLLECTION

The main study was conducted at Kachkumrakali and Anderia of Taldi Panchayat, South 24 paragnas district of West Bengal in the month of May and June,

after getting formal permission from the Principal, Omayal Achi College of Nursing, ethical clearance from International Centre for Collaborative Research and Panchayat Pradhan of Taldi Panchayat, West Bengal.

Self introduction about the investigator and information regarding the nature of the study was explained to the selected adolescent girls' parents and adolescent girls to gain co-operation in the procedure of data collection. Privacy and confidentiality was maintained during the process of data collection. A written consent was obtained from the selected adolescent girl's parents and assent from the adolescent girls. Based on the inclusion and exclusion criteria, the investigator selected 30 adolescent girls from Kachkumrakali as experimental group and 30 adolescent girls from Anderia as control group. The sampling technique used was non- probability purposive sampling technique.

The required materials such as weighing machine, measuring tape, knowledge questionnaire, printed materials, pencils, papers and the photo electric digital colorimeter with reagents to check Hemoglobin was kept ready for data collection.

Data collection was done at different timings for the experimental group and control group on the same day by the investigator.The Adolescent girls were gathered in a school permitted by the village authorities. The investigator with the certified lab technician checked the hemoglobin levels of the adolescent girls with photo digital colorimeter and reports were documented. The adolescent girls with mild, moderate, and severe anemia were grouped together, then clinical assessment was carried out separately by the investigator and another qualified nurse, using modified WHO palmar pallor guidelines and the findings were documented.

Then, Tab.Albendazole 400mg was administered to all anemic adolescent girls in empty stomach, followed by 50 ml of curd was administered after six hours to deworm and to promote the growth of healthy bacteria. The next day all the adolescent girls with anemia were gathered in the same place and the investigator imparted knowledge through video show explanation in the aspects of general health and nutrition, definition of anemia, causes, signs and symptoms, diagnosis, treatment and prevention of anemia and portrayed poster on iron rich diet .

From the second day through the 28th day the investigator along with the adolescent girls of experimental group, prepared the drumstick leaf juice and boiled bengal gram dhal for the required day. Preparation included, adding of 9 kg of clean washed drumstick leaves in 9 litres of boiling water and cooking for 10 minutes, and strained. Then 2250 gms of jaggery was dissolved in this strained drumstick leaves juice and once again strained .Then 30 gms of iron fortified salt and juice of 15 lemons was dissolved in the juice when it was luke warm. 300ml of this juice was given to each adolescent girl with anemia 2 hours before lunch. To prepare boiled bengal gram dhal, 750 gms of dhal was soaked for 2 hours in water and boiled with 30 grams of iron fortified salt in the pressure cooker. Then juice of 15 lemons was added. 75 gms of dhal was given to each adolescent girl with anemia one hour after taking drumstick leave juice as a supplement of protein. These above preparations were given for 27 days for all adolescent girls with mild, moderate, severe anemia in the experimental group. On the 35th day post test for hemoglobin, clinical assessment, biophysical assessment and knowledge on anemia was assessed.

3.16 PLAN FOR DATA ANALYSIS

Data collected was analysed by using both descriptive and inferential statistics.

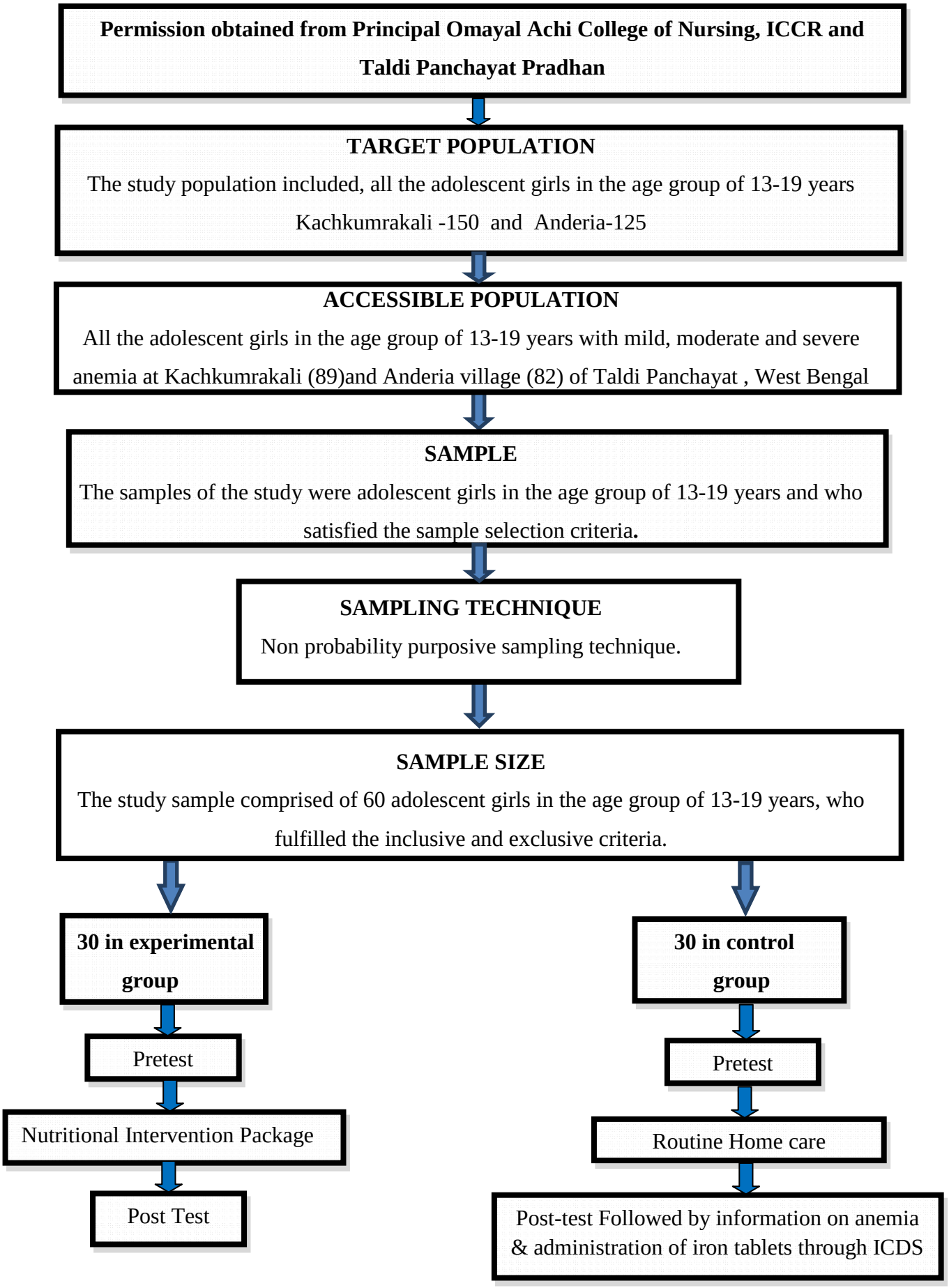
Descriptive statistics

1. Frequency and percentage distribution to analyze the demographic variables.
2. Mean and standard deviation to assess the level of knowledge and hemoglobin level among adolescent girls in the experiment and control group.
3. Co-relation coefficient was used to assess the relationship between the post test level of knowledge with level of anemia among experimental group.

Inferential statistics

1. Paired and unpaired ‘t’ test was used to assess the effectiveness between pre and post test level of knowledge and level of anemia between experimental and control group.
2. One Way ANOVA was used to find out the association of mean differed level of knowledge and level of anemia with selected demographic variables in experimental group.

SCHEMATIC REPRESENTATION



DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of data collected from two villages at West Bengal, to study the effectiveness of nutritional intervention package on anemia among adolescent at selected rural settings West Bengal. The data findings have been analyzed, interpreted, and represented in tables and graphs.

The analysis and interpretation is done according to the objectives using descriptive and inferential statistics data analysis. The results are furnished below under the following sections.

ORGANIZATION OF DATA

SECTION 4.1: Description of Demographic variables of the adolescent girls with anemia.

SECTION 4.2: Assessment of pretest and posttest level of knowledge on anemia among adolescent girls in the experimental and control group.

SECTION 4.3: Assessment of pretest and post level of anemia among adolescent girls in the experimental and control group.

SECTION 4.4: Effectiveness of nutritional interventional package on knowledge and level of anemia among adolescents with anemia.

SECTION 4.5: Correlation of post- test level of knowledge with level of anemia among adolescent girls in the experimental group.

SECTION 4.6: Association of mean difference score of knowledge and level of anemia in experimental and control group with selected demographic variables.

SECTION 4.1: DESCRIPTION OF DEMOGRAPHIC VARIABLES OF THE ADOLESCENT GIRLS WITH ANEMIA.

Table 4.1.1 : Frequency and percentage distribution of age, birth order and education of the adolescent girls.

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Age of the adolescent girls (in years)**				
	13 – 15	20	66.67	17	56.67
	16 – 17	6	20.00	12	40.00
	18 – 19	4	13.33	1	3.33
2.	**Birth order of the adolescent girl**				
	First born	8	26.67	11	36.67
	Middle born child	11	36.67	11	36.67
	Last born	11	36.67	8	26.67
	Only child	0	0.00	0	0.00
3.	**Education of the adolescent girl**				
	Non-literate	1	3.33	3	10.00
	Primary education	4	13.33	4	13.33
	High school	24	80.00	23	76.67
	Higher secondary and above	0	0.00	0	0.00
	Graduate and above	1	3.33	0	0.00

Table 4.1.1 depicts the frequency and percentage distribution of age, birth order and education of the adolescent girls with anemia**.**

In the experimental group 20(66.67%) were in the age group of 13-15 years, and 4(13.33%) belonged to the age group of 16-19 years. Similarly in the control group 17(56.67%) in the age group of 13-15 years and only 1(3.33%) belonged to the age group of 18-19 years.

With regard to the birth order, in the experimental group, the eldest children contributed to 8(26.67%), middle born and last born children were 11(36.67%), whereas in control group first born and middle born children were 11(36.67%).

Considering the educational status of the adolescent girls, majority were in high school 24(80%) and 1(3.33%) were non-literate. Similarly in the control group, majority 23(76.67%) were in high school and 3(10%) were non-literate.

Table 4.1.2: Frequency and percentage distribution of education of the father and mother of the adolescent girls.

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1	**Education of the mother**				
	Non-literate	18	60.00	18	60.00
	Primary education	9	30.00	7	23.33
	High school	3	10.00	5	16.67
	Higher secondary	0	0.00	0	0.00
	Graduate and above	0	0.00	0	0.00
2.	**Education of the father**				
	Non-literate	7	23.33	12	40.00
	Primary education	12	40.00	8	26.67
	High school	9	30.00	6	20.00
	Higher secondary	2	6.67	3	10.00
	Graduate and above	0	0.00	1	3.33

Table 4.1.2 shows the frequency and percentage distribution, with regard to education of the adolescents' mothers and fathers.

With regard to education of the adolescent girls' mothers and fathers, in the experimental group 18(60%) were non-literate, 9(30%) of the mothers had primary education and 3(10%) had high school education. Similarly in the control group 18(60%) were non-literate and 5 (16.67%) were high school educated.

With regard to education of the adolescent girls' fathers in the experimental group 7(23.23%) were illiterate, 12(40%) had primary education and only 2(6.67%) had higher secondary education. Similarly, in control group, 12(40%) were illiterate, 8(26.67%) had primary education, 6(20%) had high school education and only 3(10%) had higher secondary education.

Table 4.1.3: Frequency and percentage distribution of occupation of the adolescent girls, adolescent girls' father and adolescent girls' mother

N=60

S.NO.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1	**Occupation of the adolescent girl**				
	Student	28	93.33	27	90.00
	Skilled	0	0.00	0	0.00
	Home maker	2	6.67	3	10.00
	Semi skilled	0	0.00	0	0.00
	Self employed	0	0.00	0	0.00
2	**Occupation of the father**				
	Skilled	3	10.00	4	13.33
	Semi skilled	2	6.67	1	3.33
	Unskilled	9	30.00	14	46.67
	Self employed	15	50.00	11	36.67
	Unemployed	1	3.33	0	0.00
3	**Occupation of the mother**				
	Skilled	0	0.00	1	3.33
	Semi skilled	0	0.00	0	0.00
	Unskilled	5	16.67	1	3.33
	Self employed	2	6.67	2	6.67
	Home maker	23	76.67	26	86.67

Table 4.1.3 depicts the frequency and percentage distribution of occupation of the adolescent girls, adolescent girls' father and adolescent girls' mother

The majority of the adolescent girls were students 28 (93.93%) in experimental group and 27(90%) in control group .The rest of the adolescent girls were home makers in both experimental 2(6.67%) and control group 3(10%).

With regard to occupation of the father in the experimental group, 15(50%) were self- employed, 9(30%) were unskilled workers and 3(10%) were skilled workers. Correspondingly, in the control group 11(36.67%) were self employed, 14(46.67%) were unskilled workers and 11(36.67%) were 4(13.33%) were skilled workers.

Considering the occupation of the mothers majority of them were homemakers in the experimental group 23(76.67%) and 26(86.67%) in the control group.

Table 4.1.4: Frequency and percentage distribution of type of family, total family income and religion of the adolescent girl.

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Type of family**				
	Joint	11	36.67	16	53.33
	Nuclear	19	63.33	13	43.33
	Extended	0	0.00	1	3.33
	Separated	0	0.00	0	0.00
2	**Monthly family income**				
	Less than Rs.5000/-	20	66.67	16	53.33
	RS.5000/- - Rs.10000/-	9	30.00	12	40.00
	Rs.10000/- - Rs.15000/-	1	3.33	2	6.67
	More than Rs.15000/-	0	0.00	0	0.00
3	**Religion**				
	Hindu	8	26.67	14	46.67
	Christian	1	3.33	1	3.33
	Muslim	21	70.00	15	50.00
	Others	0	0.00	0	0.00

Table 4.1.4 depicts the frequency and percentage distribution of type of family, total family income and religion of the adolescent girl.

With regard to type of family, in the experimental group, 19(63.63%) the adolescent girls belonged to nuclear family and 11(36.67%) belong to joint family, while in the control group 16(53.33%),belonged to joint family, 13(43.33%) were from nuclear family and 1(3.33%) adolescent belonged to extended family.

With regard to the income, in the experimental group 20(66.67%) were from < Rs.5000/- category, 9 (30%) were from Rs.5000-10,000/- category. Similarly in the control group 16(53.33%) belonged to < Rs.5000/- category and 12(40%) belong to Rs.5000-10,000/- category. Whereas only 1(3.33%) in the experimental and 2(6.67%) control group belonged to Rs.10,000 -15000/- category.

Considering the religion, majority were Muslims in both experimental 21(70%) and in control group 15(50%), while minority were Christians 1(3.33%) in both the groups.

Table 4.1.5: Frequency and percentage distribution of age at menarche, duration of menstrual cycle and regularity of menstrual cycle

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Age at menarche**				
	<12 yrs	1	3.33	9	30.00
	12 - 14 yrs	27	90.00	18	60.00
	14 - 16 yrs	2	6.67	3	10.00
	16 - 19 yrs	0	0.00	0	0.00
2.	**Duration of menstrual cycle**				
	1 - 2 days	0	0.00	1	3.33
	3 -4 days	19	63.33	21	70.00
	5 days	8	26.67	2	6.67
	>5 days	3	10.00	6	20.00
3.	**Menstrual cycle**				
	Regular	22	73.33	19	63.33
	Irregular	8	26.67	11	36.67
	Others	0	0.00	0	0.00

The table 4.1.5 depicts the frequency and percentage distribution of age at menarche, duration of menstrual cycle and regularity of menstrual cycle.

Regarding attainment of menarche, in the experimental group majority of the adolescent girls 27(90%) attained menarche between the age of 12-14 years and in control group 18(60%) attained menarche between the age of 12-14 years. Attainment of menarche before 12 years was on the higher range, 9(30%) in the control group compared to experimental group 1(3.03%).

With regard to the duration of menstruation, in the experimental group 19(63.33%) of the adolescent girls had 3-4 days menstruation and in the control group 21(70 %) had 3-4 days menstruation, while 3(10%) in the experimental group and 6(20%)in the control group had menstruation that lasted more than 5 days.

Considering the menstrual cycle, in the experimental group majority of them had regular cycles 22(73.33%) and 11(36.67%) had irregular cycles. Similarly in the control group and 19(63.33%) had regular cycles while 8(26.67%) irregular cycles in the experimental and control group respectively.

Table 4.1.6: Frequency and percentage distribution of flow of menstruation and dysmennorhea.

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Flow of menstruation**				
	Normal	12	40.00	8	26.67
	Scanty	4	13.33	5	16.67
	Moderate	5	16.67	12	40.00
	Heavy	9	30.00	5	16.67
2.	**Dysmennorhea**				
	Yes	16	53.33	15	50.00
	No	14	46.67	15	50.00
3.	**Measures taken for menstrual problems**				
	Rest	12	40.00	16	53.33
	Seeking medical help	3	10.00	2	6.67
	Medicine from local pharmacy	4	13.33	3	10.00
	Daily routine	11	36.67	9	30.00

Table 4.1.6 depicts the frequency and percentage distribution of flow of menstruation and dysmennorhea.

With regard to the flow of menstruation in the experimental group, 12(36.36%) had normal flow, 4(12.12%) had scanty flow and the flow was heavy among 9(30.00%) of the adolescent girls. Similarly in the control group 8(26.67%) had normal flow, 5(15.15%) had scanty flow, 12(40%) had moderate flow and 5(16.67%) had heavy flow.

With regard to dysmennorhea, in the experimental group 16(53.53%) had dysmennorhea and 14(46.67%) had no dysmennorhea and correspondingly in the control group 15(48.48%) had dysmennorhea and 15(45.45%) had no dysmennorhea.

With regard to measures taken for menstrual problems, most of the adolescent girls took rest in both experimental 12(40%) and control group 16(53.53%), while only 3(10%) from the experimental group and 2(6.67%) in control group sought medical help.

Table 4.1.7: Frequency and percentage distribution of recent illness and visit to health centre

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	**%**	**No.**	**%**
1.	**Any history of recent illness of diarrhea/dysentery/fever/pylori/worm infestation/others**				
	Yes	6	20.00	4	13.33
	No	24	80.00	26	86.67
2.	**Previous visit to health centre**				
	Yes	0	0.00	3	10.00
	No	30	100.00	27	90.00

Table 4.1.7 depicts the frequency and percentage distribution of recent illness and visit to health centre and treatment.

With regard to recent illness, in **t**he experimental group 6(20%) of the adolescent girls had some minor illness recently (within 3 months) and none of them reported to the health centre. Similarly in the control group 4(13.33 %) reported minor illness recently and 3(10%) sought medical attention.

Table 4.1.8: Frequency and percentage distribution of blood transfusion, feeling tired or decreased activity and irritability.

N=60

S. No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Any recent blood transfusion**				
	Yes	0	0.00	0	0.00
	No	30	100.00	30	100.00
2.	**Feeling tired or decreased activity**				
	Yes	25	83.33	20	66.67
	No	5	16.67	10	33.33
3.	**Seem to be irritable**				
	Yes	22	73.33	17	56.67
	No	8	26.67	13	43.33

The table 4.1.7 depicts the frequency and percentage distribution of blood transfusion, feeling tired or decreased activity and irritability.

With regard to blood transfusion, in both the groups nobody had any recent blood transfusion.

With regard to feeling tired or decreased activity, in the experimental group majority 25(83.33%) of the adolescent girls felt tired or decreased activity and 5(16.67%) did not feel tired. Similarly in the control group 20(66.67%) reported tiredness and decreased activity and 10(33.33%) did not report tiredness.

Considering irritability, it was reported by majority 22 (73.33%) of the adolescent girls in the experimental group and 17(56.67%) in the control group.

Table 4.1.9: Frequency and percentage distribution of type of diet, meal frequency and meal timings of adolescent girls.

N=60

S. No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1	**Type of diet**				
	Vegetarian	3	10.00	4	13.33
	Vegan	1	3.33	1	3.33
	Lacto-Vegetarian	0	0.00	0	0.00
	Non-vegetarian	26	86.67	25	83.33
2.	**Meal Frequency**				
	3 times a day	24	80.00	20	66.67
	2 times a day	6	20.00	10	33.33
	Irregular	0	0.00	0	0.00
3.	**Meal timings each day**				
	Regular	17	56.67	24	80.00
	Often	3	10.00	2	6.67
	Irregular	10	33.33	4	13.33

Table 4.1.9 depicts the frequency and percentage distribution of type of diet, meal frequency and meal timings of adolescent girls.

With regard to type of diet, in the experimental group majority 26(86.67%) of the adolescents were non-vegetarians and 3 were vegetarian, correspondingly, in the control group 25(83.33%) were non-vegetarians and 4(13.33%) were vegetarians and 1(3.33%) were vegans in both groups.

With regard to the meal frequency, in the experimental group majority 24(80%) had 3 meals a day, 6(20%) adolescents the habit of 2 meals per day, while in the control group 20(66.67%) had 3 meals a day and 10(33.33%) of had the habit of 2 meals per day.

Considering the meal timings each day, 17(56.67%) from experiment group had regular meal timings, while 10(33.33%) had irregular meal times. Similarly in the control group 24(80%) had regular meal timings, while 4(13.33%) had irregular meal timings.

Table 4.1.10: Frequency and percentage distribution of appetite, skipping of meals and frequency of skipping meals of adolescent girls.

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Appetite**				
	Poor	6	20.00	5	16.67
	Fair	13	43.33	12	40.00
	Good	11	36.67	13	43.33
2.	**Skipping of meals**				
	Yes	17	56.67	14	46.67
	No	13	43.33	16	53.33
3.	**Frequency of skipping meals**				
	Daily	2	6.67	5	16.67
	Frequently	10	33.33	7	23.33
	Rarely	5	16.67	2	6.67
	NA	13	43.33	16	56.67

Table 4.1.10 depicts the frequency and percentage distribution of appetite, skipping of meals and frequency of skipping meals of adolescent girls.

Considering appetite of the adolescent girls in the experimental group 13(43.33%) had fair appetite, 6(20%) had poor appetite. Similarly in the control group 12(40%) had good appetite and 5(16.67%) had poor appetite.

With regard to skipping meals, in the experimental group 17(56.67%) and in the control group 14(46.67%) skipped meals.

Considering the frequency of skipping meals, 2(6.67%), in the experimental group skipped daily, 10(33.33%) skipped frequently and 5(16.67%) skipped rarely, whereas, in the control group, 5(16.67%) skipped daily, 7(23.23%) skipped frequently and 2(6.67%) in control group skipped rarely.

Table 4.1.11: Frequency and percentage distribution of compensation of skipped meals, food allergy and use of iron fortified salt among adolescent girls.

N=60

S.No.	Demographic Variables	Experimental (n=30)		Control (n=30)	
		No.	%	No.	%
1.	**Compensation of skipped meals with snacks**				
	Yes	4	13.33	7	23.33
	No	13	43.33	6	20.00
	NA	13	43.33	17	56.67
2.	**History of food allergy**				
	Yes	4	13.33	3	10.00
	No	26	86.67	27	90.00
3.	**Usage iron fortified salt**				
	Yes	0	0.00	0	0.00
	No	30	100.00	30	100.00

The table 4.1.11 depicts the Frequency and percentage distribution of compensation of skipped meals, food allergy and use of iron fortified salt among adolescent girls.

With regard to compensation of skipped meals with snacks, the experimental group, 13 (43.33%) of the adolescent girls in had no habit of compensating the skipped meals and only 4 (13.33%) compensated skipped meals with snacks. Similarly, in the control group 6(20%) had no habit of compensating the skipped meals. Only 7(23.23%) compensated skipped meals with snacks.

With regard to history of food allergy, majority of the adolescent girls 26(86.67%) in the experimental group had no history of food allergy, while 4(13.13%) had history of food allergy to certain particular food items (Brinjal, Yam). Similarly, in the control group 27(90%) had no history of food allergy, 3(10%) in the control group had history of food allergy.

Considering the usage of iron fortified salt, none of them had used iron fortified salt.

SECTION 4.2: BIOPHYSICAL VARIABLES.

Table 4.2.1 : Frequency and percentage distribution of Weight and Height of the adolescent girls in the experimental and control group

N=60

Biophysical Variables		EXPERIMENTAL GROUP				CONTROL GROUP			
		Inadequate mean weight		Normal		Inadequate mean weight		Normal	
		No.	%	**No.**	**%**	**No.**	**%**	No.	%
Weight	Pretest	10	33.33	20	66.67	14	46.67	16	53.33
	Post Test	10	33.33	20	66.67	14	46.67	16	53.33
Height	Pretest	0	0	30	100	0	0	30	100
	Post Test	0	0	30	100	0	0	30	100

Table 4.2.1 depicts the frequency and percentage distribution of weight and height among adolescent girls experimental group.

With regard to weight, it shows that among the adolescent girls in the experimental group, 10(33.33%) were underweight and 20(66.67%) were normal weight in the pretest as well as in the post test. In the control group 14(46.67%) were under weight and 16(53.33%) were normal weight in the pre-test and in the post-test

With regard to height, in both the groups in pretest as well as in the post test the mean height was adequate 30(100%)

Table 4.2.2: Frequency and percentage distribution of BMI among adolescent girls – Experimental group and control group

N=60

BMI	EXPERIMENTAL				CONTROL GROUP			
	Underweight (<18.5)		Normal (18.5 – 24.9)		Underweight (<18.5)		Normal (18.5 – 24.9)	
	No.	%	No.	%	No.	%	No.	%
Pretest	21	70.0	9	30.0	22	73.33	8	26.67
Post Test	20	66.67	10	33.33	22	73.33	8	26.67

Table 4.2.2 depicts the frequency and percentage distribution of BMI among adolescent girls experimental group.

With regard to BMI, it shows that among the adolescent girls in the experimental group, 21(70%) were underweight, 9(30%) were normal weight in the pre-test while in the post-test 20(66.67%) were underweight and 10(33.33%) were normal weight. In the control group, 22(73.33%) were underweight, 8(26.67%) were normal weight in the pre-test and post test.

SECTION 4.3:

Table 4.3.1: Frequency and percentage distribution of clinical signs adolescent girls in the experimental and control group.

N=60

Observations	Experimental				Control			
	Pretest		Post Test		Pretest		Post Test	
	No.	%	No.	%	No.	%	No.	%
Pallor	12	40.0	12	40.0	16	53.33	16	53.33
Pale Conjunctiva	26	86.67	26	86.67	27	90.0	27	90.0
Pale Lips	10	33.33	10	33.33	9	30.0	11	36.67
Pale nails	22	73.33	22	73.33	26	86.67	27	90.0
Koilonychias	1	3.33	1	3.33	1	3.33	1	3.33
Scanty Hair	2	6.66	2	6.66	2	6.66	2	6.66

Table 4.3.1 depicts the frequency and percentage distribution of clinical signs present among the adolescent girls with anemia in the experimental and control group.

In the experimental group, in both pre-test and post-test, pallor was present in 12(40%) and 10(33.33%), Pale conjunctiva was found in majority 26(86.67%) of the adolescent girls in pre and post-test. Pale lips was present in 10(33.33%) in the pretest and 8(26.26%) in the post test. Next to pale conjunctiva, pale nails was present in many of the adolescent girls, 22(73.73%) in pre-test and 19(63.33%) in post-test, and koilonychias was present in only 1(3.03%) in both pre-test and post-test while scanty hair was present in 2(6.66%) in the pretest and post test.

In the control group both in pre-test and post-test, pallor was present in 16(53.33%), Pale conjunctiva was found in majority 27(90%) of the adolescent girls in pre and post-test. Pale lips was present in 9(30%) in the pretest and 11(36.67%) in the post test. Pale nails was present in 26(73.73%) adolescent girls in pre-test and 27(90%) in post-test, and koilonychias was present in only 1(3.03%) in both pre-test and post-test while scanty hair was present in 2(6.66%) in the pretest and post test.

SECTION 4.4: ASSESSMENT OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE ON ANEMIA AMONG ADOLESCENT GIRLS IN THE EXPERIMENTAL AND CONTROL GROUP.

n=30

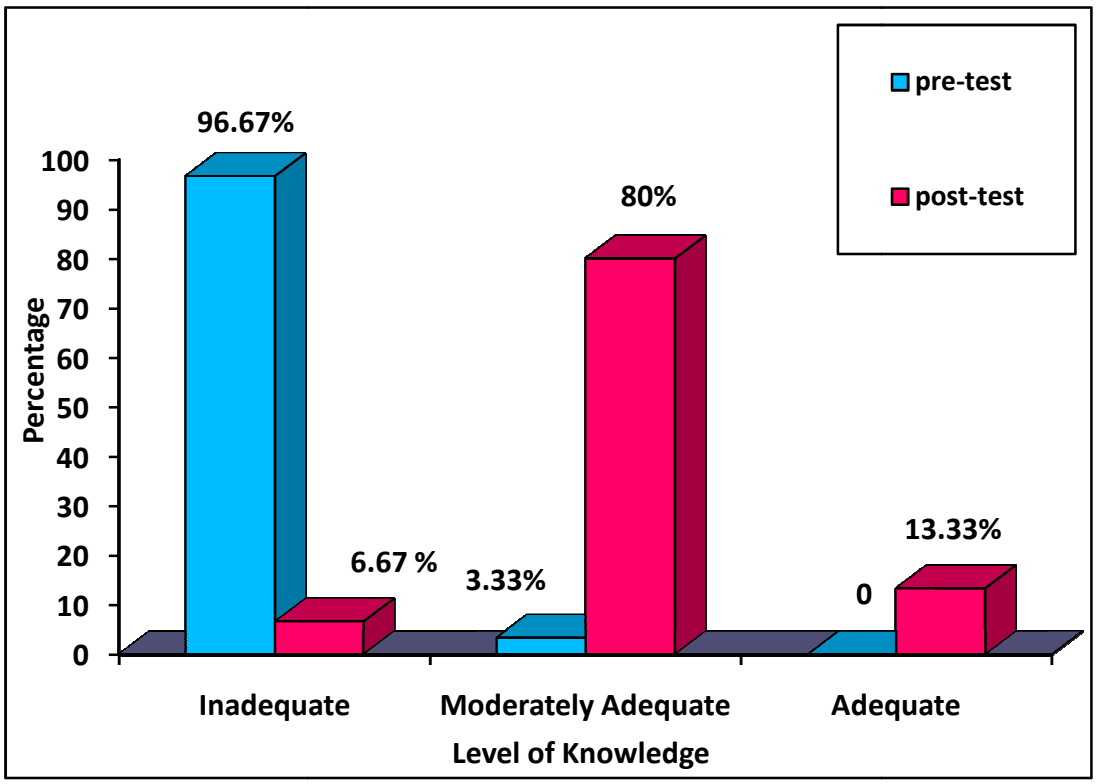


Figure 4.4.1: Percentage distribution of pre-test level of knowledge on anemia among adolescent girls in the experimental group

The figure 4.4.1 depicts the frequency and percentage distribution of pretest and post test knowledge among adolescent girls in the experimental group.

With regard to knowledge in pre-test in the experimental group , majority of the adolescent girls 29(96.67%) had inadequate knowledge and only 1(3.33%) had moderately adequate knowledge and none of them had adequate knowledge.

With regard to post-test, there was a significant improvement in the knowledge that majority 24(80%) gained moderately adequate knowledge, 4 (13.33%) had adequate knowledge and 2(6.67%) inadequate knowledge.

n=30

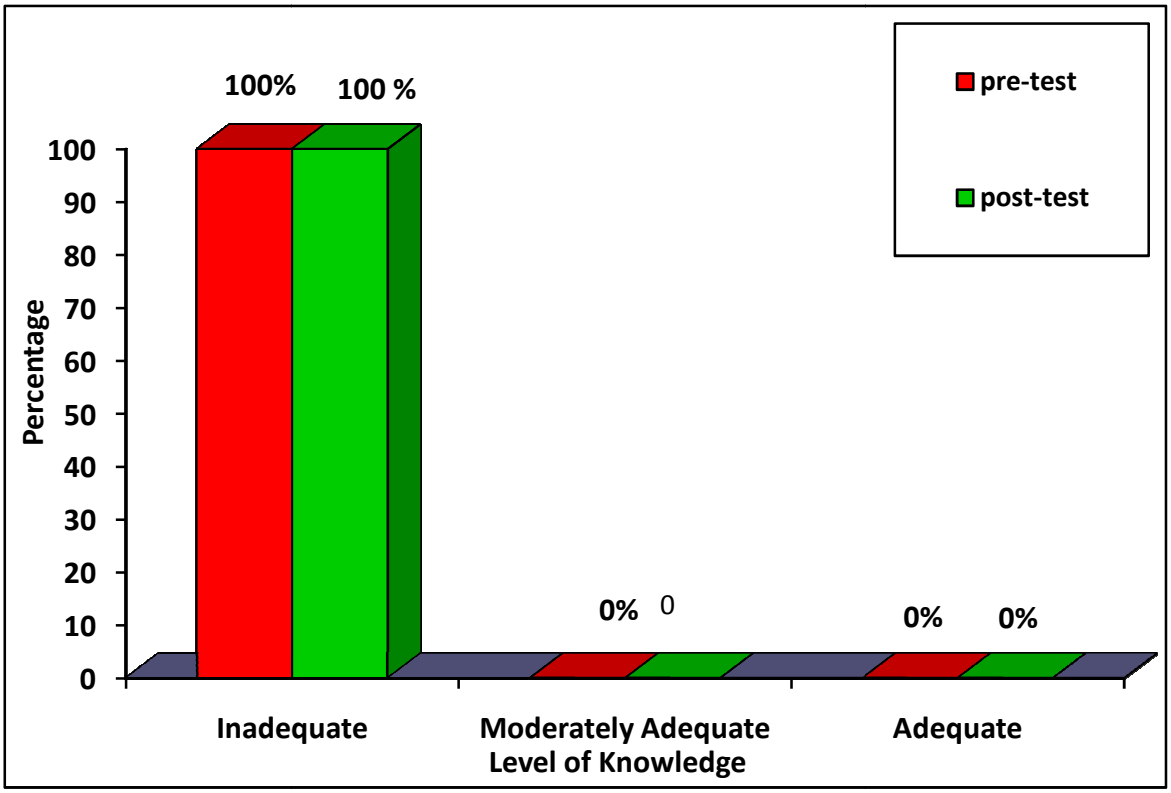


Figure 4.4.2: Percentage distribution of pre-test level of knowledge on anemia among adolescent girls in the control group.

The figure 4.4.2 depicts the frequency and percentage distribution of knowledge among adolescents in the control group. The overall knowledge score among the adolescent girls was inadequate 30(100%) in pre-test. Similarly in the post test, there was no change in the knowledge on anemia among adolescent girls that it was inadequate 30(100%).

SECTION 4.5: ASSESSMENT OF PRETEST AND POSTTEST LEVEL OF ANEMIA AMONG ADOLESCENT GIRLS IN THE EXPERIMENTAL AND CONTROL GROUP.

n=30

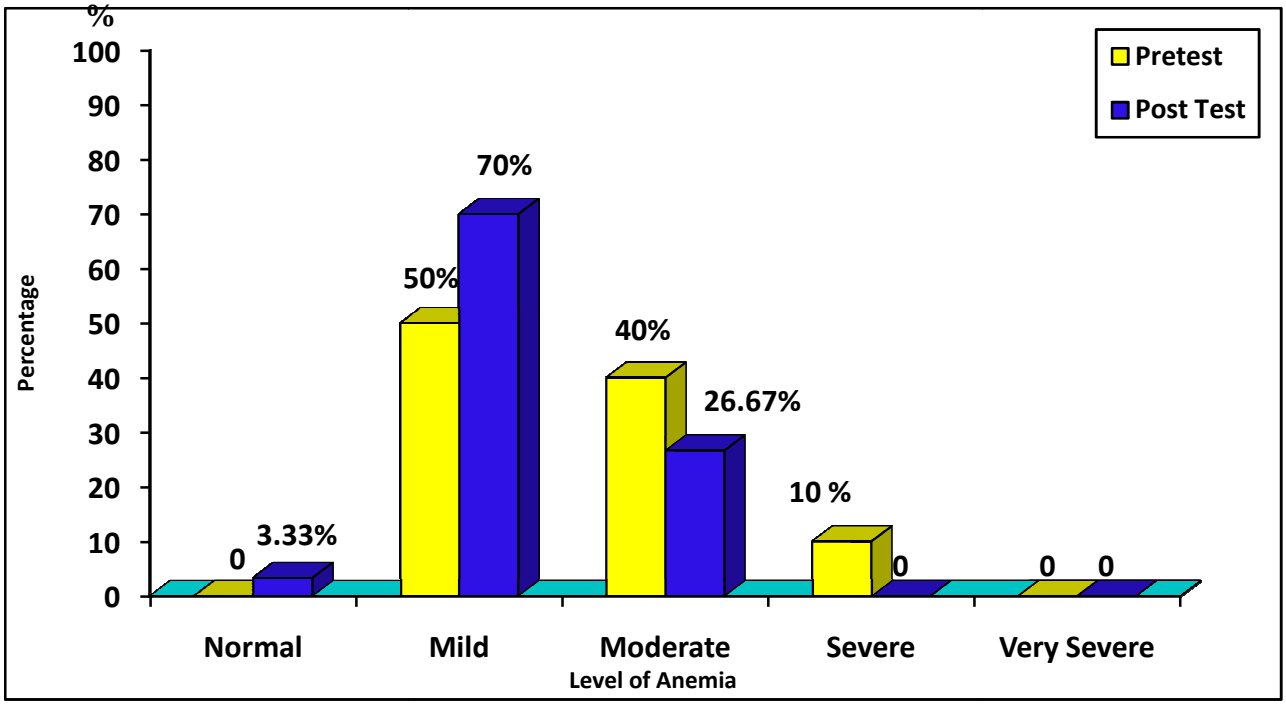


Figure 4.5.1: Percentage distribution of pretest and post level of anemia among adolescent girls in the experimental group.

The figure 4.5.1 depicts the frequency and percentage distribution of pretest and post-test hemoglobin level among adolescents in the experimental group.

In the pre-test none of the adolescent girls had normal hemoglobin, 15(50%) had mild anemia, 12(40%) had moderate anemia and 3(10%) had severe anemia. whereas in the post-test majority of the adolescent girls 22(70%) had only mild anemia, 8(26.67%) had moderate anemia and 1(3.03%) adolescent girl had normal hemoglobin and none of them had severe anemia.

n=30

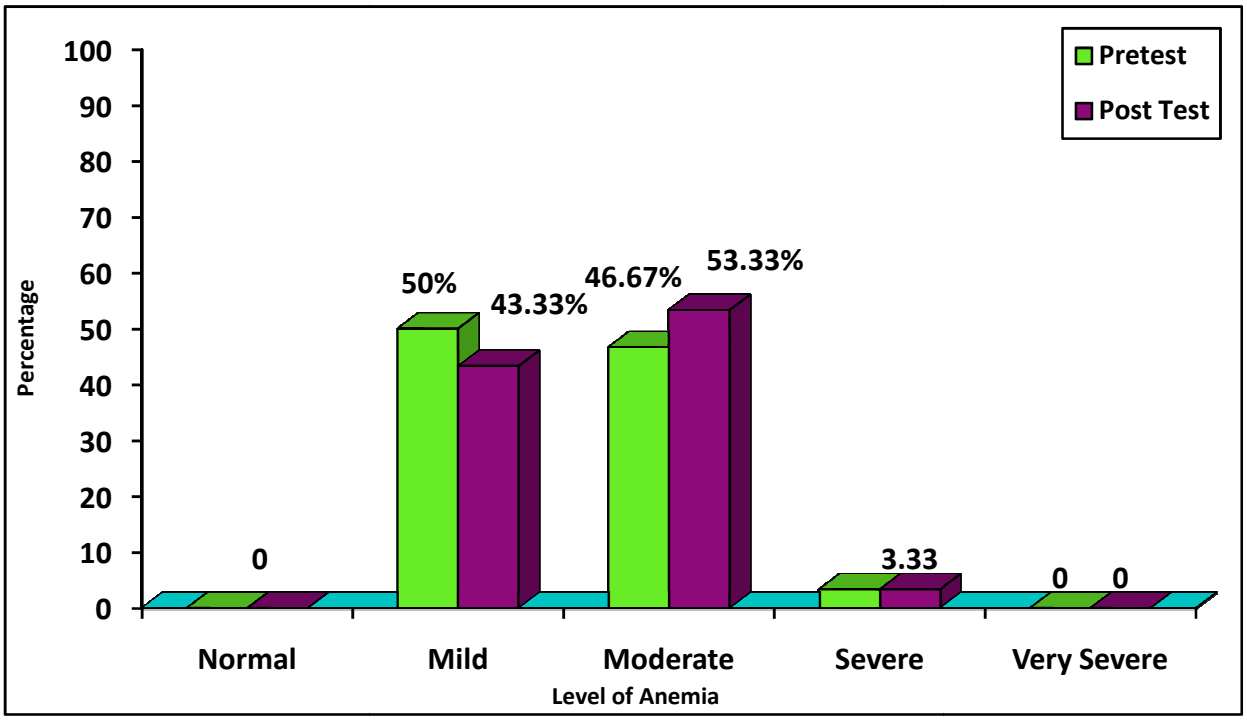


Figure 4.5.2: Percentage distribution of pretest and post level of anemia among adolescent girls in the control group.

The figure 4.5.2 shows the assessment of pretest and post- test hemoglobin level among adolescent girls in the control group.

In the pre-test and in post-test none of the adolescent girls had normal hemoglobin. In the pretest alone 15(50%) had anemia and 14(46.67%) had moderate anemia, 1(3.33%) had severe anemia. In the post-test 13(43.33%) adolescents had mild anemia, 16(53.33%) had moderate anemia and 1(3.03%) had severe anemia.

SECTION 4.6 : EFFECTIVENESS OF NUTRITIONAL INTERVENTIONAL PACKAGE ON KNOWLEDGE AND LEVEL OF ANEMIA AMONG ADOLESCENTS WITH ANEMIA.

Table 4.6.1 : Comparison of pretest and post test knowledge score on anemia among adolescent girls in the experimental and control group.

N=60

Group	Knowledge	Mean	S.D	Paired 't' Value
Experimental	Pretest	8.37	1.83	t = 20.087*** p = 0.001, S
	Post Test	16.37	2.20	
Control	Pretest	8.40	1.38	t = -0.926 p = 0.362, N.S
	Post Test	8.73	1.72	

***p<0.001, S – Significant, N.S – Not Significant

Table 4.6.1 signifies that the comparison between the pre-test and post-test knowledge score on anemia in the experimental and control group.

In the experimental group, the pretest mean score was 8.37 with S.D 1.83 and the post- test mean score was 16.37 with S.D 2.20. The calculated 't' value was t = 20.087 which was statistically highly significant at p<0.001 level.

In the control group, the pretest mean score was 8.40 with S.D 1.38 and the post-test mean score was 8.73 with S.D 1.72. The calculated 't' value was t = 0.926 which was statistically non significant .

Table 4.6.2: Comparison of pretest and post test hemoglobin among adolescent girls in the experimental and control group

N=60

Group	Exp. Hemoglobin	Mean	S.D	Paired 't' Value
Experimental	Pretest	9.47	1.47	t = 10.500*** p = 0.001, S
	Post Test	10.66	1.19	
Control	Pretest	9.56	1.28	t = 2.109 p = 0.054, N.S
	Post Test	9.40	1.28	

***p<0.001, S – Significant, N.S – Not Significant

Table 4.6.2 indicates the comparison between the pre-test and post-test hemoglobin score among adolescent girls in the experimental and control group.

In the experimental group, the pretest mean score was 9.47 with S.D 1.47 and the post- test mean score was 10.66 with S.D 1.19. The calculated 't' value was t = 10.500 which was statistically highly significant.

In the control group, the pretest mean score was 9.56 with S.D 1.28 and the post-test mean score was 9.40 with S.D 1.28. The calculated 't' value was t = 2.109 which was statistically non significant.

Table 4.6.3: Comparison of post test knowledge score on anemia among adolescent girls between the experimental and control group

N=60

Group	Mean	S.D	Unpaired 't' Value
Experimental Group (n=30)	16.37	2.20	t = 14.949*** p = 0.001, S
Control Group (n=30)	8.73	1.72	

***p<0.001, S – Significant

Table 4.6.3 indicates the comparison of the post-test knowledge score on anemia among adolescent girls between the experimental and control group. The mean score was 16.37 with S.D 2.20 in the experimental group and the mean score was 8.73 with S.D 1.72 in the control group. The calculated 't' value was 14.949 which were statistically significant.

Table 4.6.4: Comparison of post test hemoglobin score among adolescent girls between the experimental and control group.

N=60

Group	Mean	S.D	Unpaired 't' Value
Experimental Group (n=30)	10.66	1.19	t = 3.932*** p = 0.001, S
Control Group (n=30)	9.40	1.28	

***p<0.001, S – Significant

Table 4.6.4 indicates the comparison of pre-test and post-test hemoglobin score among adolescent girls between the experimental and control group. The post test mean score was 10.66 with S.D 1.19 in the experimental group and it was 9.40 with S.D 1.28 in the control group. The calculated 't' value was 3.932 which were statistically highly significant.

Table 4.6.5: Comparison of the mean increment or reduction in the hemoglobin levels between experimental and control group.

N=60

Group	Intervention	N	Mean ± SD	Mean Difference	Percent increment or reduction	't' test	Level of Significance
Experimental Group (n=30)	Pre-test	30	9.46 ± 1.47	1.19 ± 0.62	↑ 1.37	10.500	0.000**
	Post-test	30	10.66 ± 1.19				
Experimental Group (n=30)	Pre-test	30	9.56 ± 1.28	-0.15 ± 0.40	↓ 1.55	2.109	0.044*
	Post-test	30	9.40 ± 1.28				

** Significant at p value < 0.001

Table 4.6.5 shows a significant 1.37 percent increase in the mean hemoglobin levels (9.46 ± 1.47 to 10.66 ± 1.19 mg/dl)at the end of the supplementation period in the experimental group ($p < 0.000$), while the control group showed a significant 1.55 percent decrease in the mean hemoglobin levels (9.56 ± 1.28 to 9.40 ± 1.28 mg/dl) at the end of the study period ($p< 0.05$).

The results were highly significant in the experimental group, thus the nutritional intervention package was effective in improving knowledge and level of anemia among the adolescent girls in the experimental group.

SECTION 4.7: CORRELATION BETWEEN THE POST TEST KNOWLEDGE AND HEMOGLOBIN SCORE AMONG ADOLESCENT GIRLS.

Table 4.7.1 : Correlation between the post test knowledge and hemoglobin score among adolescent girls in the experimental and control group.

N = 60

Group	Variables	Mean	S.D	'r' Value
Experimental	Knowledge	16.37	2.20	r = -0.488**
	Hemoglobin	10.66	1.19	p = 0.006, S
Control	Knowledge	8.73	1.72	r = -0.169
	Hemoglobin	9.40	1.28	p = 0.372, N.S

**p<0.01, S – Significant, N.S – Not Significant

Table 4.7.1 depicts the correlation between the post-test knowledge and hemoglobin score among adolescent girls in the experimental and control group.

In the experimental group, the mean differed knowledge score was 16.37 with an SD of 2.20 and the post-test hemoglobin mean was 10.66 with the SD of 1.19.The calculated 'r' value of 0.488 at p<0.006 level that showed a high positive correlation.

In the control group, the post-test knowledge mean score was 8.73 with an SD of 1.72 and the post-test hemoglobin mean was 9.40 with the standard deviation 1.28, with the 'r' value of 0.169 and p value of 0.372 that is statistically not significant.

SECTION 4.8: ASSOCIATION OF SELECTED DEMOGRAPHIC VARIABLES WITH THE MEAN DIFFERENCE SCORE ON LEVEL OF ANEMIA AMONG ADOLESCENT GIRLS IN THE EXPERIMENTAL GROUP

n=30

Demographic Variables	Pretest		Post Test		Mean Diff.		ANOVA/Unpaired 't' test
	Mean	S.D	Mean	S.D	Mean	S.D	
Age of the adolescent girls							F = 3.845 P = 0.034 S*
13 – 14	9.58	1.38	10.76	1.09	1.18	0.47	
15 – 16	9.59	1.65	10.40	1.51	0.81	0.57	
17 – 19	8.71	1.89	10.54	1.44	1.82	0.97	
Type of family							t = 2.702 p = 0.012 S*
Joint	10.06	1.34	10.90	0.98	0.85	0.46	
Nuclear	9.13	1.47	10.51	1.29	1.39	0.62	
Extended	-	-	-	-	-	-	
Separated	-	-	-	-	-	-	
Flow of menstruation							F = 4.079 p = 0.017 S**
Normal	9.35	1.43	10.47	1.38	1.11	0.39	
Scanty	8.83	2.02	10.84	1.60	1.01	0.70	
Moderate	8.27	1.87	10.21	1.36	1.95	0.97	
Heavy	10.13	0.54	11.08	0.45	0.95	0.28	

**p<0.01, S – Significant, N.S – Not Significant

Section 4.8 illustrates the association of mean differed level of hemoglobin among adolescents with respect to age, type of family and flow of menstruation. One way ANOVA F test and unpaired 't' test was used to find out the association between the level of hemoglobin among adolescents with their demographic variables. The calculated F value (F=4.079) indicated that there was a moderate association (P= 0.017) with the flow of menstruation with the mean score of 1.95 for moderate flow. There was mild association with the age of the adolescent girls in the age group of 17-19 years with the mean score of 1.82 for at (p=0.034) with the level of hemoglobin. With regard to type of family, the mean score of 1.39 for the nuclear family at (p=0.012) with the level of hemoglobin. And there was no significant association present with the other demographic variables. Hence the variables which influences the level of hemoglobin are age, type of family and flow of menstruation are also depicted in the figure below.

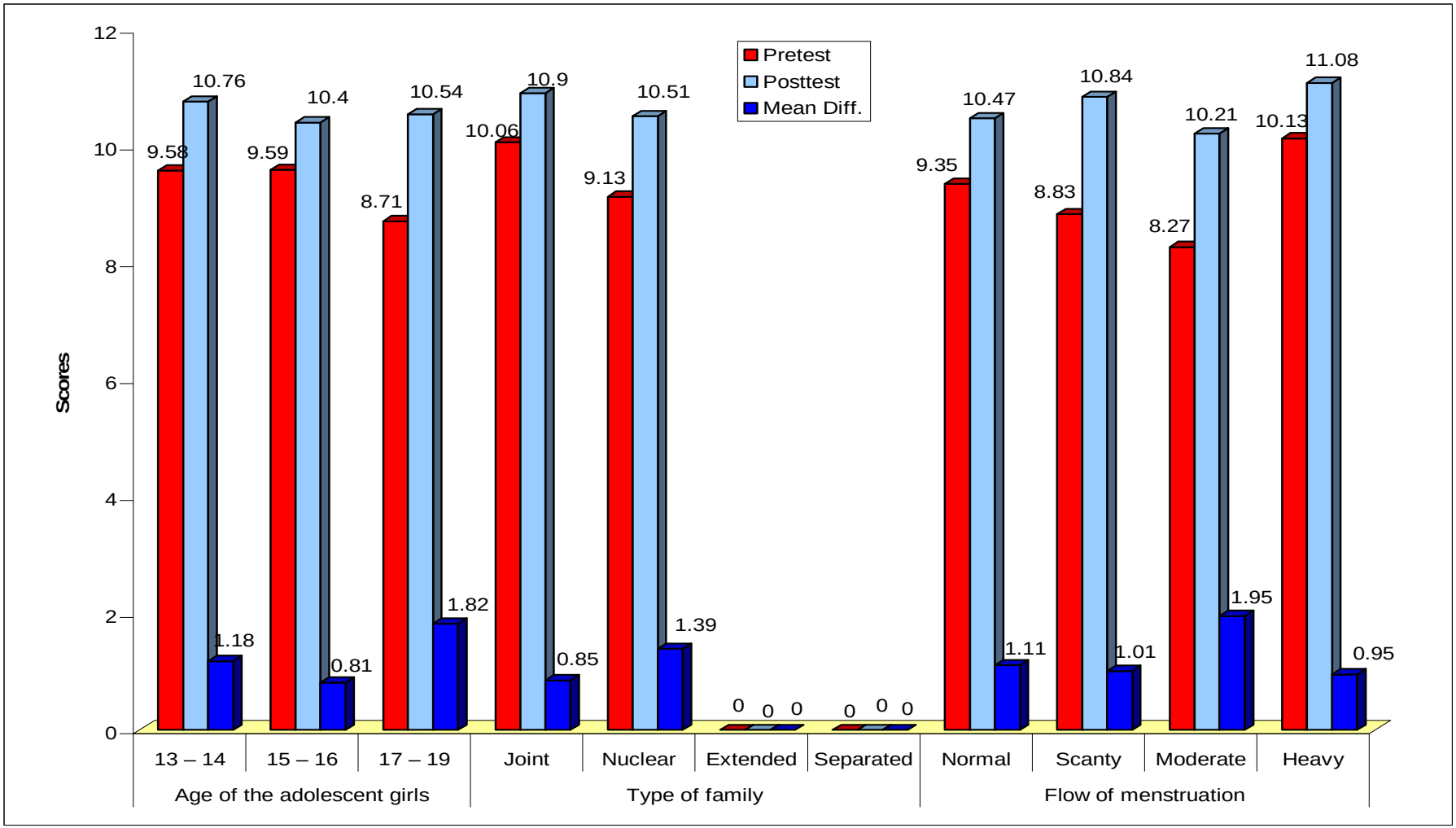


Figure 4.8.1: Association of selected demographic variables with the mean difference score on level of anemia among adolescent girls in the experimental group

DISCUSSION

This chapter elaborates the findings of the statistical analysis in relation to the objectives of the study. The discussion is based on the objectives, the review of literature and null hypotheses specified in this study.

The study was conducted to assess the effectiveness nutritional intervention package on knowledge and level of anemia among adolescent girls.

Description of Demographic Variables

Table 4.1.1 to 4.1.11 revealed that majority of adolescent girls the belonged to the age group 13-15 years, 20(66.67%) in the experimental group and 17(56.67%) in the control group. In both the groups most of the mothers of the adolescent girls, were non-literate. 19(63.63%) of adolescent girls belong to nuclear family in the experimental group and 16(53.33%) belonged to joint family in the control group. In regard to income, 20(66.67%) from experimental group and 16(53.53%) belonged to < Rs.5000/- income group. 8(26.77%) in the experimental group and 11(36.67%) in the control group, had irregular cycles. Heavy menstrual flow was reported by 9(30.00%) in the experimental group and 5(16.67%) in the control group. Dysmennorhea was reported by 16(53.53%) of the adolescent girls in the experimental group and 15(50%) in the control group. Majority 25(83.33%) of the adolescent girls in the experimental group and 20(66.67%) from control group reported tiredness and decreased activity. Irritability was reported by 22(73.33%) in the experimental group and 17(56.67%) in the control group. Skipping of meals was found in 17(56.67%) experimental group and 14(46.67%) in the control group. In both groups none of them have used iron fortified salt.

5.1 The first objective was to assess the frequency of anemia among adolescent girls.

The study was conducted at Kachkumrakali and Anderia villages of Taldi Panchayat of 24 south Paragnas district, West Bengal. The Total population in Kachkumrakali was 1075 and 892 in Anderia. The adolescent girls of age group 13-19 years were 150 and 125 in the above mentioned villages respectively. Among 89 adolescent girls from Kachkumrakali and 82 from Anderia who were willing for assessment of hemoglobin, 46 (51.68 %) adolescent girls from Village Kachkumrakali

had anemia (<12gm/dL), and in Anderia Village 44 (53.65%). had anemia (<12gm/dL) Among the 46(51.68%) of anemic adolescent girls at Kachkumrakali 23(50%) had mild anemia, 18(39.13%) had moderate anemia and 5(10.86%) had severe anemia and none of them had very severe anemia. In Anderia among the 44(53.65%) who had anemia, 25(56.8%) had mild anemia 16 (36.36%) had moderate anemia and 3(6.8%) had severe anemia and none had very severe anemia.

This findings were supported by **Shilpa S Biradar et al (2012)** who conducted a cross sectional study among 840 adolescent girls of 10-19 years of from rural West Bengal to assess the prevalence of anemia and to study the association of anemia with respect to the age of the participants and their socio-economic status. The results revealed that the prevalence of anemia was 41.1%. Among them mild anemia was present in 34.6%, moderate anemia 6.3% and severe anemia was 0.6%. The higher prevalence of anemia was present in adolescents who belonged to the low socio-economic status.

5.2 The second objective was to assess and compare the pre-test and post-test level of knowledge and level of anemia in the experimental and control group.

Figure 4.4.1 reveals the analysis on knowledge assessment. In the pre-test of the experimental group, majority of the adolescent girls 29(96.67%) had inadequate knowledge and only 1(3.33%) had moderately adequate knowledge and none of them had adequate knowledge.

With regard to post-test, there was a significant improvement in the knowledge that majority 24(80%) gained moderately adequate knowledge, 4(13.33%) had adequate knowledge and 2(6.67%) inadequate knowledge.

The figure 4.4.2 depicts **t**he analysis revealed that the overall knowledge score among the adolescent girls was inadequate 30(100%) in pre-test. Similarly in the post test, there was no change in the knowledge on anemia among adolescent girls that it was inadequate 30(100%).

The pretest mean score for knowledge was 8.37 with S.D 1.83 and the post- test mean score was 16.37 with S.D 2.20. The calculated‘t’ value was t = 20.087 which was found to be statistically highly significant at p<0.001 level in the experimental group.

Figure 4.5.1 reveals the analysis on level of anemia depicted that pretest and post-test hemoglobin level among adolescents in the experimental group revealed that in the pre-test none of them had normal hemoglobin, 15(50%) had mild anemia, 12(40%) had moderate anemia and 3(10%) had severe anemia. In the post-test 1(3.03%) adolescent girls had normal hemoglobin; 22(70%) had mild anemia, 8(26.67%) had moderate anemia and none of them had severe anemia.

Figure 4.5.2 shows the analysis of pretest and post- test hemoglobin level among adolescent girls in the control group, showed that, in the pre-test and in post-test none of them had normal hemoglobin. In the pretest alone 15(50%) had mild anemia and 14(46.67%) had moderate anemia, 1(3.33%) had severe anemia. In the post-test 13(43.33%) adolescent girls had mild anemia, 16(53.33%) had moderate anemia and 1(3.03%) had severe anemia.

The pretest mean score for level of anemia was 9.47 with S.D 1.47 and the post-test mean score was 10.66 with S.D 1.19. The calculated‘t’ value was t = 10.500 which was statistically highly significant at p < 0.001 level.

The above findings were consistent with the study conducted by **Manjeet Kaur, Roopam Bassiz and Saurab Sharma** to assess the impact of nutrition education in reducing iron deficiency anemia in adolescent medical students in Amristar. The study revealed that there was significant improvement in the hemoglobin levels after 12 months of nutrition education intervention. The study concluded that education is one of the most appropriate and effective strategy to combat anemia among adolescent girls.

5.3 The third objective was to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among experimental group.

Table 4.6.1 signifies that the comparison between the pre-test and post-test knowledge score on anemia among experimental group. The pretest mean score was 8.37

with S.D 1.83 and the post- test mean score was 16.37 with S.D 2.20. The calculated‘t’ value was t = 20.087 which was statistically highly significant at p<0.001 level.

Table 4.6.2 analysis signifies the comparison between the pre-test and post-test knowledge score on anemia among adolescent girls in control group. The pretest mean score was 8.40 with S.D 1.38 and the post- test mean score was 8.73 with S.D 1.72. The calculated‘t’ value was t = 0.926 which was statistically non significant

Table 4.6.3 analysis indicates the comparison between the pre-test and post-test hemoglobin score among adolescent girls in the experimental group. The pretest mean score was 9.47 with S.D 1.47 and the post- test mean score was 10.66 with S.D 1.19. The calculated‘t’ value was t = 10.500 which was statistically highly significant.

Table 4.6.5 analysis indicates the comparison of the post-test knowledge score on anemia among adolescent girls between the experimental and control group. The mean score was 16.37 with S.D 2.20 in the experimental group and the mean score was 8.73 with S.D 1.72 in the control group. The calculated‘t’ value was 14.949 which were statistically significant.

Table 4.6.6 analysis indicates the comparison of pre-test and post-test hemoglobin score among adolescent girls between the experimental and control group. The post test mean score was 10.66 with S.D 1.19 in the experimental group and it was 9.40 with S.D 1.28 in the control group. The calculated‘t’ value was 3.932 which were statistically highly significant.

The investigator adapted Wiedenbachs Helping Art of Clinical Nursing and prescriptive theory to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls. So the investigator developed a prescription that is nutritional intervention package that included education on management on anemia and nutritional supplement, based on central purpose and implemented to accomplish the goals. The recipients were the adolescent girls with anemia. The framework was village Kachkumrakali and Anderia of Taldi Panchayat, West Bengal. Validating the needed help was met through standard knowledge

questionnaire, hemoglobin assessment and modified WHO palmar pallor guidelines. The analysis proved that there was improvement in the knowledge and level of hemoglobin. Hence the investigator recommended enhancement of the intervention.

The above findings were consistent with the study conducted by **Nambiar, Paramani and Guin (2010)** who conducted a quasi experimental study to assess the effect of drumstick leaves and vitamin C supplementation on hematological indices of adolescent girls between the age of 16-21 of Vadodara, Gujarat. There was a reduction in prevalence of anemia in group A who were given drumstick leaves with lentils and lime juice compared to group B and C who were getting other interventions. The study showed a strong association between vitamin C and iron. Drumstick leaves which is rich in beta carotene (19690 mcg/100g) along with vitamin C from lemon juice has a positive impact in the mobilization of stored iron and increase hemoglobin levels of anemic subjects.

Hence the Null Hypothesis **(NH_1)** stated earlier that **"there is no significant difference between the pre-test and post test level of knowledge and level of anemia among the experimental and control group at $p < 0.001$"** was rejected for the experimental group and accepted for the control group.

5.4 The fourth objective was to correlate the post test level of knowledge with level of hemoglobin in experimental group and control group.

Table 4.7.1. analysis reveals the correlation results showed that the mean differed knowledge score was 16.37 with an SD of 2.20 and the post-test hemoglobin mean was 10.66 with the SD of 1.19.The calculated 'r' value of 0.488 at $p < 0.006$ level that showed a positive correlation.

Table 4.7.2, depicts the correlation between the post-test knowledge and hemoglobin score among adolescent girls in the control group. The post-test knowledge mean score was 8.73 with an SD of 1.72 and the post-test hemoglobin mean was 9.40 with the standard deviation 1.28, with the 'r' value of 0.169 and p value of 0.372 that is statistically not significant.

The result revealed that there was a positive correlation between the mean differed knowledge with the level of anemia that indicated the increase in knowledge among the adolescent girls influences the hemoglobin levels significantly.

The above data is consistent with the quasi experimental study conducted by **Alaofe et al (2009)** to assess the effectiveness of nutrition education and increasing the bioavailability of dietary iron content among 68 school children between 12-17 years in Benin. The results revealed significant increase in the mean hemoglobin level and serum ferritin level in the experimental group ($p = .0002$). The study concluded that the education and multidimensional dietary approach plays a role in reducing anemia among adolescent girls.

Hence the Null Hypothesis **(NH_2)** stated earlier that **"there is no significant relationship between the post test level of knowledge with level of anemia in the experimental group at $p < 0.006$ level"** was rejected for the experimental group and accepted for the control group.

5.5 The fifth objective was to associate the selected demographic variables with the mean differed score of knowledge and level of anemia among adolescent girls in the experimental group.

The one way ANOVA F test revealed that there was significant association of the mean differed score on level of anemia regard to the flow of menstruation, age and type of family at $p < 0.01$ level. And there was no significant association present with the other demographic variables.

Hence the Null Hypothesis **(NH_3)** stated earlier that "**there is no significant association between the mean differed level of knowledge on anemia with selected demographic variables at $p < 0.05$"** was accepted for flow of menstruation, age of the adolescent girl and type of family and rejected for other demographic variables.

SUMMARY, CONCLUSION, IMPLICATIONS RECOMMENDATIONS AND LIMITATIONS

This chapter describes the summary, conclusion, implications, recommendations and limitations of the study.

6.1 SUMMARY

Anemia in adolescent girls is one of the severe public health epidemics. Iron deficiency is the major cause for anemia among adolescent girls. The normal biological growth spurt, menstrual blood loss, reduced dietary intake, the strenuous physical work, early marriages and child birth puts them at a risk of developing anemia. In developing countries like India, anemia is the root cause that constitute to a number of health related problems among adolescent girls.

The health programmes that are planned and conducted at local, national and international level, such as the adolescent anemia control programme to reduce the prevalence of anemia. But it is essential to reach them at grass root level to demonstrate the simple practical ways to prevent anemia through education, orientation about locally available cheap sources of iron, dietary modification and dietary fortification.

6.1.1 Statement of the problem

The purpose of the study was to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls.

6.2.2 The objectives of the study were

1. To assess the frequency of anemia among adolescent girls.
2. To assess and compare the pre-test and post-test level of knowledge and level of anemia in the experimental and control group.
3. To assess the effectiveness of nutritional intervention package on knowledge and level of anemia among experimental and control group.
4. To correlate the post test level of knowledge with the level of anemia among experimental and control group.

5. To associate the selected demographic variables with mean differed score of knowledge and level of anemia among experimental group.

6.2.3 The study was based on the assumptions that

1. Adolescent girls may have anemia.
2. The nutritional intervention package may help to improve knowledge and level of anemia among adolescent girls.
3. Increased level of knowledge on anemia may improve the dietary habits and improve the level hemoglobin.

6.2.4 The null hypotheses formulated were

NH_1 There is no significant difference in the pre test and post test level of knowledge and level of anemia between experimental and control group.

NH_2 There is no significant relationship between the post test levels of knowledge with level of hemoglobin in experimental group.

NH_3 There is no significant association between the mean differed score of knowledge and level of hemoglobin among adolescent girls with selected demographic variables in experimental group.

The review of relevant literature included related studies from relevant fields along with the researcher's professional experience laid a strong foundation for the study.

In view of explaining and explaining the concepts, the investigator has adopted the conceptual framework of "WIEDENBACH'S HELPING ART OF CLINICAL NURSING AND PRESCRIPTIVE THEORY".

The researcher adopted a quasi experimental, non equivalent control design to select 30 adolescent girls for experimental and 30 adolescent girls for the control group. The adolescent girls were selected using non probability purposive sampling technique.

The tool developed for the study consisted of the following

PART A: DATA COLLECTION TOOL

PART B: INTERVENTION TOOL

PART A:

SECTION 1: Demographic variables of the adolescent girls.

SECTION 2: Bio physical variables consisted of

1. **Anthropometric Measurements:** Height, Weight, BMI. The mean weight and height was calculated according to ICMR modified mean weight and height for adolescent girls.
2. **Level of hemoglobin by using cyanmethemoglobin method with photo electric colori meter**

   This is the most preferred and the most accurate method for determining the hemoglobin and the hemoglobin concentration.

Procedure

1. The nurse Investigator explains the procedure in Bangla / English
2. Obtained informed consent
3. The site was cleaned with alcohol swab and fresh venous blood 1ml was collected into the EDTA vial. It was mixed well and incubated at room temperature for 5 minutes.
4. From that 20 micro litre of blood is drawn through pipette and added in 5 ml of drabkin's solution in a test tube.
5. It is tested and documented by the certified lab technician.

Level anemia was calculated based on ICMR hemoglobin scale for adolescent girls aged 13-19 years.

1. Normal Hb levels : 12.0–14 g/dL
2. Mild anemia : 10.0–11.9 g/dL
3. Moderate anemia : 7.0–9.9g/dL
4. Severe anemia : < 7.0 g/dL
5. Very severe Anemia : < 4.0 g/dL

3. Clinical Assessment based on modified WHO palmar pallor guidelines

It consisted of 6 signs, if any one sign is present the score was '1' and if it is not present the score was given '0'

1. Scanty hair
2. Pallor
3. Pale conjunctiva
4. Pale Lips
5. Koilonychias
6. Pale nails

SECTION 3: KNOWLEDGE QUESTIONNAIRE

It consisted of structured knowledge questionnaire to assess the level of knowledge on anemia with the following components

- Introduction to general health, nutrition and anemia (10 questions)
- Causes, signs and symptoms and Diagnosis (5 questions)
- Treatment and complications (5 questions)
- Home Care management of anemia. (5 questions)

Scoring key

Each item was a closed ended multiple choice questions with single correct answer. Each correct response was awarded with a score of '1' mark and the wrong question was awarded with a score of '0' marks. Total score was 25. Maximum score was 25 and minimum score was '0'.

PART B: INTERVENTION TOOL

SECTION 1: Education on management of anemia through video show and poster presentation.

- **Video Show included the aspects of**
  - Introduction to general health, nutrition and anemia
  - Causes and signs and symptoms of anemia
  - Diagnosis of anemia
  - Treatment for anemia
  - Home Care management of anemia.
- **Poster-was projected on iron rich diet.**

SECTION 2: ADMINISTARTION OF NUTRITIONAL SUPPLEMENT

- Administration of Tab.Albendazole 400mg in empty stomach to deworm and administration of curd 50 ml, after six hours of deworming to promote the growth of healthy bacteria in the intestines for all adolescent girls with mild, moderate and severe anemia.
- Administration of 300 ml of drumstick leave juice, with iron fortified salt and lime juice was given everyday two hours before lunch for 27 days, for each adolescent girl with mild, moderate and severe anemia.
- 75 Gms of boiled Bengal gram dhal with iron fortified salt and lime juice was given every day one hour before lunch for 27 days for each adolescent girl with mild, moderate and severe anemia.

The content validity of the tool was established by medical and nursing experts. Reliability of the tool was established by interrater method and test-retest method. The reliability of the photo electric colorimeter was done through interrated method.The pilot study was conducted at Boyersing and Uttar Taldi of Taldi Panchayat.

Main findings of the study

The main study was conducted at Kachkumrakali and Anderia of Taldi Panchayat, South 24 paragnas district of West Bengal in the months of May to June'2013.The data collected was analysed using descriptive and inferential statistics. Interpretation and discussion was based on the objectives of the study, null hypothesis, and conceptual framework and research studies from literature review.

- The analysis of pre-test showed that the overall knowledge score was inadequate 29(96.67%) in the experimental group and 30(100%) and control group.
- The analysis of the post-test revealed that the majority 24(80%) of the adolescent girls in the experimental group had moderately adequate knowledge.
- The analysis of pre-test on level of anemia among adolescent girls in the experimental group depicted that none of them had normal hemoglobin, 15(50%) had mild anemia, 12(40%) had moderate anemia and 3(10%) had severe anemia. In the post-test 1(3.03%) adolescent girls had normal hemoglobin; 22(70%) had mild anemia, 8(26.67%) had moderate anemia and none of them had severe anemia.

- The post-test mean score for knowledge was 8.37 with S.D 1.83 and the post- test mean score was 16.37 with S.D 2.20. The calculated‘t’ value was t = 20.087 which was found to be statistically highly significant at p<0.001 level in the experimental group.
- The post-test mean score for level of anemia was 9.47 with S.D 1.47 and the post- test mean score was 10.66 with S.D 1.19. The calculated‘t’ value was t = 10.500 which was statistically highly significant at p < 0.001 level.
- The correlation results showed that the mean differed knowledge score was 16.37 with an SD of 2.20 and the post-test hemoglobin mean was 10.66 with the SD of 1.19.The calculated ‘r’ value of 0.488 at p < 0.006 level that showed a high positive correlation.
- The result revealed that there was a positive correlation between the mean differed knowledge with the level of anemia that indicated the increase in knowledge among the adolescent girls influences the hemoglobin levels significantly.
- The one way ANOVA F test revealed that there was significant association of the mean differed knowledge score on anemia in regard to the flow of menstruation, age and type of family at p< 0.01 level. And there was no significant association present with the other demographic variables.

6.2 CONCLUSION

The present study assessed the effectiveness of nutritional intervention package on knowledge and level of anemia. The findings of the study revealed that there is significant improvement in the knowledge and level of anemia among adolescents who received the intervention. Hence the nutritional intervention package can be utilized to prevent and treat anemia.

6.3 IMPLICATIONS

The investigator had drawn the following implications from this study which is of vital concern to the field of Nursing education, Nursing practice, Nursing administration and Nursing research.

6.3.1 Nursing Education

- Excellence in nursing education is essential for excellence in clinical practice.
- The nutritional intervention package can be incorporated into various therapeutic diet and cooking demonstration in the nutrition and cookery classes for the nursing students.
- Refresher courses on adolescent nutrition, adolescent health and anemia can be planned and conducted.

6.3.2 Nursing Practice

- Nurse Practitioners are called on to practice evidence based practice as well as to provide health care advice.
- Clinical importance of this nutritional intervention package can be incorporated by cooking demonstration of the nutritional supplement, for the adolescent girls at school level and community level as well as in the ICDS
- Education on the management of anemia and iron rich foods can immensely influence the dietary habits of the adolescent girls.

6.3.3 Nursing Administration

- Nurse administrators can keep the nurses informed about the prevalence of anemia among adolescent girls and the burden of anemia globally and nationally.
- Nurse administrators can coordinate and implement outreach programs in the schools and community to create awareness of anemia among adolescent girls.

6.3.4 Nursing Research

- The present study serves as a basis for professional nurses, student nurses and other professionals to conduct further research on various nutritional approaches to reduce anemia among adolescent girls.
- Studies can be conducted at natural setting that is more consumer-friendly to modify the existing practices, that would significantly play a major role in reduction of anemia among adolescent girls.
- Expanding and dissemination through internet, journals, literature helps in to promote evidence informed practice (EIP) among nurses.

6.4 RECOMMENDATIONS

1. The investigator recommends that the education on management of anemia to be used by Integrated Child Developmental Scheme centers and schools of Taldi Panchayat, south 24 paragnas district ,West Bengal.
2. The investigator recommends that similar studies can be conducted in larger samples to increase the validity of the results.
3. A comparative study can be done to assess the knowledge on anemia among adolescent girls in rural and urban areas.
4. A comparative study can be done to assess the effectiveness of the nutritional intervention package among the urban and rural adolescent girls.
5. A study can be conducted to assess the effectiveness of various cooking practices in improving iron consumption among adolescent girls.
6. Similar study can be conducted among preschool children and pregnant adolescent mothers.

6.5 LIMITATION

The researcher had difficulty in travelling as it was a very remote village with no proper roads and public transportation facilities.

6.6 PLAN FOR UTILIZATION OF RESEARCH FINDING

1. The research will be recommended to be included in the ICDS programmes and Midday meal programmes.
2. The nursing students can utilize the nutritional intervention package in community care settings of Omayal Achi College of Nursing, Chennai.

6.7 PLAN FOR RESEARCH DISSEMINATION

1. Research findings of the main study will be presented in the upcoming national, international conferences and workshops
2. Research results will be published in the Nursing Journal of India.

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APPENDIX – C

LETTER SEEKING EXPERTS OPINION FOR CONTENT VALIDITY

From

Ms. Hephzibah Dorothy .J
M.sc (N) I year,
Omayal Achi College of Nursing,
Puzhal, Chennai.

To

Respected sir/ Madam,

Sub : Requisition for expert opinion for content validity reg

I am Ms. Hephzibah Dorothy .J doing my M.sc Nursing I year specializing in Child Health nursing at Omayal Achi College of Nursing, Chennai . As a part of my research project to be submitted to the Tamil Nadu Dr. M.G.R. Medical University and in partial fulfillment of the University requirement for the award of M.sc (N) degree, I am conducting "A study to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls at selected settings, West Bengal. I have enclosed my data collection and intervention tool for your expert guidance and validation. Kindly do the needful.

Thanking you,

Yours faithfully,
(Ms. Hephzibah Dorothy .J)

Enclosure:

1. Research proposal
2. Data collection tool
3. Intervention tool
4. Content validity form
5. Certificate for content validity

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অ্যানীমিয়ার পরিচর্যা

অ্যানীমিয়ার পরিচর্যার পাঠ পরিকল্পনা

বিষয় : অ্যানীমিয়ার পরিচর্যা

শিক্ষার্থীর শ্রেনী : অ্যানীমিয়া গ্রস্থ কিশোরী

স্থান : খাস কুমড়োখালি,পশ্চিমবঙ্গ

সময় সীমা : ৩০ মিনিট

শিক্ষা পদ্ধতি : ভাষন এবং আলোচনা

পরিচালক : নিরীক্ষক

শিক্ষার উপকরণ : শিক্ষাদানের সহযোগী প্রযুক্তিগত উপকরন,পাওয়ার পয়েন্ট,ভিডিও শো এবং পোষ্টার

সাধারণ উদ্দেশ্ : ক্লাসের শেষে কিশোরীরা অ্যানীমিয়ার পরিচর্যা সম্পর্কে জ্ঞান অর্জণ এবং অ্যানীমিয়ার রোধ কারার ধনাত্মক মনোভাবের অধিকারি হয়।

নিদ্দিষ্ট উদ্দেশ্য : ক্লাসের শেষে কিশোরীরা নিম্নলিখিত উদ্দেশ্যগুলি পূর্ন করতে সমর্থ হবেঃ

- শ্বাস্থ্য এবং পুষ্ঠির অর্থ সম্পর্কে বিবৃত দেওয়া
- অ্যানীমিয়ার অর্থ সম্পর্কে বিবৃত দেওয়া
- অ্যানীমিয়ার কারণ গুলির তালিকা তৈরি করতে সমর্থন হওয়া
- অ্যানীমিয়ার চিহ্ন এবং বৈশিষ্ঠ সম্পর্কে অবগত হওয়া এবং চিকিৎসা করা
- অ্যানীমিয়ার বিভিন্ন রকমের চিকিৎসা এবং অ্যানীমিয়ার জটিলতা ব্যাক্ষা
- অ্যানীমিয়ার রোধ করার বিভিন্ন প্রক্রিয়া তালিকা তৈরি করা
- অ্যানীমিয়ার ঘরোয়া পরিচর্যা সম্পর্কে বিস্তৃত বনণা করা

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		<u>নির্দেশ</u> ✓ অ্যানীমিয়া হল শরীরের রক্তের পরিমান কম,বিশ্বব্যাপী অ্যানীমিয়ার ১.২৬ বিলিয়ন মানুষকে প্রভাবিত করে,ভারতে বিশ্বের সব থেকে বেশী সংখ্যাক অ্যানীমিয়া আক্রান্ত মহিলার প্রার্দুরভাব যেখানে ৬০-৭০% শুধু কিশোরী।		
১.	শ্বাস্থ্য এবং পুষ্ঠির অর্থ বিবৃত করা	<u>শ্বাস্থ্য এবং পুষ্ঠির অর্থ সম্পর্কে উপদেশ</u> ✓ শ্বাস্থ্য রোগ থেকে স্বাধীনতা পাওয়া নায়,এটা একটা অনুভব যা শারীরিক,মানসিক,সামাজিক এবং আত্মিক সুসমানযোগ্যতা। ✓ পুষ্ঠি শব্দের অর্থ বলতে বোঝায় পর্যাপ্ত পরিমান খাদ্য গ্রহণ করা।শ্বাস্থ্যকর জিবনের জন্য বিশষ করে কিশোরীদের জন্য ভাল পুষ্ঠি গুরুত্ব পূর্ণ,অ্যানীমিয়া রোধ করার জন্য।প্রোটিন,শর্করা,জল,চর্বি,ভিটামিন এবং খণিজ লবণের মত সমস্থ পুষ্ঠিগুন সম্নিত সঠিক খাদ্য খাওয়া,বিশেষ করে উচ্চ আয়রণ যুক্ত খাদ্য সুন্দর শ্বাস্থ্য গঠনের এবং অ্যানীমিয়া রোধ করতে সাহায্য করে।.	পাওয়ার পয়েন্টের সাহায্যে ভাষণ এবং আলোচনা করা	শ্রবণ
২.	অ্যানীমিয়ার অর্থ বিবৃত করা	<u>সংজ্ঞা</u> ✓ অ্যানীমিয়া হল এক অবস্থা যখন আপনার রক্তে যথেষ্ট পরিমান স্বাস্থ্যকর লোহিত রক্তকনি্কা বা হিমোগ্লোবিনের অভাবের লক্ষন প্রকাশ পায়। হিমোপ্লোবিন হল লোহিত রক্তনিকার প্রধান অংশ এবং শরীরের কোষসমূহ অক্সিজেন পরিবহন করে। যদি আপনার অনেক কম পরিমানে বা অস্বাভাবিক লোহিত রক্ত কনিকা থাকে, অথবা আপনার হিমোপ্লোবিন অস্বাভাবিক বা	পাওয়ার পয়েন্টের সাহায্যে ভাষণ এবং আলোচনা করা	শ্রবণ

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		কম,তাহলে আপনার শরীরের কোষগুলি যথেষ্ট অক্সিজেন পাবে না।		
৩.	অ্যানীমিয়ার কারণ তালিকা	<u>অ্যানীমিয়ার প্রকারভেদ</u> আয়রন-অভাবজনিতঅ্যানীমিয়া,যেটাসবথেকেবেশীদেখাযায়এটাখ্যাদ্যাভাম প্রিবর্তন ও আয়রন ট্যাবলেটের মাধ্যমে চিকিৎসা করা যায়। ✓ অ্যানীমিয়া যা গর্ভাবস্থাকালীন হয়। ✓ অ্যানীমিয়া যা রক্তক্ষরণের দ্বারা সৃষ্টি হয়। ✓ অ্যানীমিয়া যা কমে যাওয়া বা ত্রুটিপূর্ণ লোহিত রক্তনিকার উৎপাদনের ফলে সৃষ্টি হয়। ✓ অ্যানীমিয়া যা লোহিত রক্তনিকার ধ্বংসের কারনে সৃষ্টি হয়। ✓ ভিটামিনের অভাবের ফলে সৃষ্টি হয়। ✓ হাড়মজ্জা এবং মূলকোষ এর সমস্যার জন্য সৃষ্টি হয়। ✓ অন্যান্য শারিরিক অবস্থার জন্য।	ভিডিও এবং পাওয়ার পয়েন্টের সাহায্যে ভাষণ এবং আলোচনা করা	শ্রবণ
৪.	অ্যানীমিয়া চিহ্ন এবং বৈশিষ্ট্য সম্পর্কে অবগত হওয়া সুচিকিৎসা করা	<u>লক্ষণঃ</u> ✓ ক্লান্তিএবংদুর্বলতা। ✓ ফ্যাকাসে ত্বক এবং শ্লেস্মাজনক ঝিল্লী ✓ দ্রুত হৃদস্পন্দন বা এক নতুন কল্‌কল্‌ শব্দের হৃদস্পন্দন(আপনার সন্তানের ডাক্তার দ্বারা সনাক্তকরণ করা) ✓ ক্রোধ পাচণতা ✓ ক্ষুধা কমে যাওয়া।	পাওয়ার পয়েন্টের সাহায্যে ভাষণ এবং আলোচনা করা	শ্রবণ

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		✓ মাথা ঘোরা বা মাথা হাল্কা হবার একটা অনুভূতি ✓ পিকা যেমন পেইন্ট চিপ্স,চক বা ময়লার মত খাবার নয় এমন সব জিনিস খাবার ইছা জাগে।পিকা খাবারে আয়রণের পরিমাণ কম থাকার কারণে হতে পারে। ✓ <u>রোগ নির্নয়</u> ✓ ইতিহাস ✓ শারিরিকপরীক্ষানিরীক্ষা ✓ হিমোগ্লোবিনেরপরিমাপ		
৫.	অ্যানীমিয়ার বিভিন্ন রকমের চিকিৎসা এবং অ্যানীমিয়ার জটিলতা ব্যাখা করা।	<u>আয়রণঅভাবজনিতঅ্যানীমিয়ারচিকিৎসা</u> ✓ কৃমিনাশকরা ✓ অতিরিক্ত আয়রণ ✓ উচ্চআয়রণ ও প্রোটিনযুক্ত খাবার ✓ মাল্টিডিটামিনবিশেষকরেফলিকঅ্যাসিড,ভিটামিন B12 এবং ভিটামিন C আয়রণ শোষণ ক্ষমতাকে বৃদ্ধি করে ✓ অ্যানীমিয়াযদিগুরুত্বরহয়যাসম্ভবতমৃত্যুমুখীকরতেপারেতাহলেহাসপাতালে ভর্ত্তি এবং রক্ত দেওয়া জরুরী। <u>জটিলতা</u> অল্প আয়রণের অভাবে হওয়া অ্যানীমিয়া সাধারণত জটিল হয়ে ওঠে না,তার সত্তে ও যদি চিকিৎসা না করানো হয়।আয়রণ অভাবজনিত অ্যানীমিয়া গুরুতর হয়ে যেতে পারে এবং বিভিন্ন রকম শারিরিক সমস্যার দেখা দিতে পারে যেমনঃ	পাওয়ার পয়েন্টের সাহায্যে উপস্থাপনা	শ্রবণ

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		<u>হৃদয়ের সমস্যা</u> আয়রণ অভাবজনিত অ্যানীমিয়া দ্রুত ও অনিয়মিত হৃদ্‌স্পন্দনের কারণ হতে পারে।যখন আপনি অ্যানীমিয়াতে ভোগেন তখনআপনার হৃদয়কে বেশীবার পাম্প করতে হয় রক্তে বহিত অক্সিজেনের চাহিদাকে মেটাতে।এর ফলে আপনার হৃদয় বেড়ে যেতে পারে বা হৃদয় অচল হয়ে যেতে পারে। <u>গর্ভাবস্থায় সমস্যা</u> গর্ভাবস্থাকালীন মহিলাদের মধ্যে গুরুতর আয়রণ অভাবজনিত অ্যানীমিয়ার ফলে নির্ধারিত সময়ে পূর্বে প্রসব হয়ে পারে এবং কম ওজনের শিশুর জন্ম দিতে পারে।কিন্তু গর্ভাবতী মহিলাদের গর্ভাবস্থাকালীন শারিরিক যত্ন নেবার সময় আয়রণ এর সহযোগিতা (অয়রণ ট্যাবলেট) নিলে এই অবস্থাকে নিবারণ ক রা যায়। <u>বৃদ্ধি সমস্যা</u> শিশু ও বাচ্ছাদের মধ্যে গুরুতর অয়রণের অভাব অ্যানীমিয়া এবং স্বীরগতির বৃদ্ধি ও বিকাশের কারণ হতে পারে।এছাড়াও আয়রণ অভাবজনিত অ্যানীমিয়া বিভিন্ন রোগ সংক্রমনের প্রবনতার সঙ্গে সম্পর্কিত।		

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
৬.	অ্যানীমিয়া রোধকরার বিভিন্ন প্রক্রিয়ার তালিকা তৈরি	<u>নিবারণ</u> ✓ অতিরিক্ত বা অনুরুপ আয়রণ সেবনউচ্চআয়রণএবংপ্রোটিনযুক্ত খাবার। ✓ নিয়মিতকৃমিনাশকরানো। ✓ ব্যায়ম এবং অনুশীলন করা ✓ চাওকফিএড়ানোএটাঅয়রণশোষণকরারক্ষমতাকেলুপ্তকরে। ✓ ঝিনুকবাশক্তিসমূহ ✓ ভিটামিনc খাওয়ার এটা আয়রণ শোষণ ক্ষমতাকে বৃদ্ধি করে। ✓ কমবয়সেবিবাহকেএড়ানো। ✓ দুইশিশুরমধ্যেঅত্যন্ততিনবছরেরব্যবধানরাখা। ✓ উচ্চআয়রণ সমৃদ্ধ ভারতীয় খাবার	পাওয়ার পয়েন্টের সাহায্যে ভাষণ এবং আলোচনা করা	শ্রবণ
৯	অ্যানীমিয়ার ঘরোয়া পরিচর্যা সম্পর্কে বিস্তৃত বনর্ণা দেওয়া।	**<u>ঘরোয়া পরিচর্যা</u>** **প্রচলিত** চিকিৎসা ছাড়া বিভিন্ন রকমের ঘরোয়া পদ্ধতিতে অ্যানীমিয়া রোধ করা।তার তালিকাটি নিচে দেওয়া হল।এছাড়া একটা উদাহরণ দেওয়া হল কি ভাবে স্থানীয় খাদ্য উ ৎস থেকে পুষ্ঠিকর খাবার বানানো যায়। আয়রণ যুক্ত ভারতীয় খাবার	ভাষণ,আলোচনা এবং পোষ্টার	শ্রবণ

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		আয়রণ যুক্ত ভারতীয় খাদ্য সমূহঃ ✓ লালমাংস ✓ বাগানেউৎপন্নশাকেরবীজ, ✓ সজনেপাতা ✓ পালংশাকওসবধরনের সবুজ পাতা বিশিষ্ট যুক্ত ✓ গুর ✓ ব্রকোলি ✓ মেথি ✓ বাঁধাকপি ✓ শস্যদানা (ধান,গম,প্রভৃতি) ✓ খেঁজুর ✓ বাদাম ✓ বীট ✓ সেঁকাআলু ✓ সোয়াবিন ✓ গাজর ✓ তরমুজ ✓ সূর্যমুখীবীজ ✓ সবুজমটর ✓ ছোলা		

ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		<u>সজনে পাতার জুম (রস) বানাবার পদ্ধতিঃ</u> ৩০০ মিলি জুস করার জন্য টপকরণ সজনে পাতা : ৩০০ গ্রাম গুড় : ৭৫ লবন এবং লেবু স্বাদমত ৩০০ গ্রাম পরিস্কার ধোয়া সজনে পাতা ৩০০ মিলি ফুটন্ত জলে দিতে হবে এবং ১০ মিনিট রান্না করতে হবে রান্না হলে জলটা ছেঁকে নিতে হবে। এর পর ৭৫ গ্রাম গুড় ওই রসের সাথে মিলিয়ে ঝেঁকে নিতে হবে। এর পর উচ্চ আয়রণ যুক্ত ১ গ্রাম লবন এবং অর্ধেক পাতিলেবু দিয়ে কুসুম গরম থাকতে পান করতে হয়। বাংলার ছোলার ডাল বা কোন ডাল ৭৫ গ্রাম ছোলার ডালকে ২ ঘন্টা জলে ভিজিয়ে রাখুন এবং সিদ্ধ হওয়া পর্যন্ত রান্না করুন,এরপর অর্ধেক পাতিলেবু এবং উচ্চ আয়রণ যুক্ত ১ গ্রাম লবন যুক্ত করুন।		

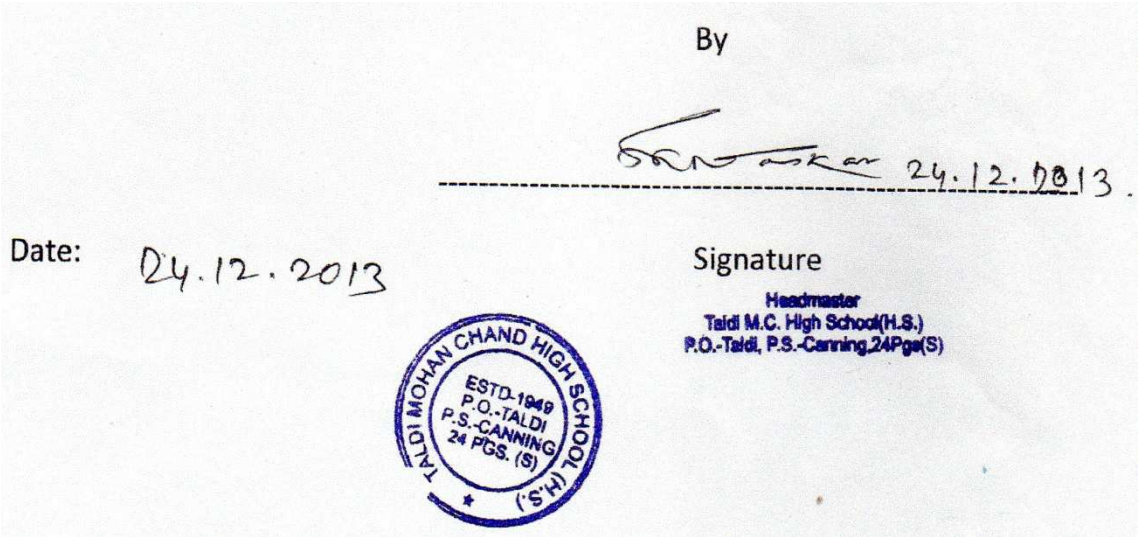
ক্রমিক নং	যোগদানকারী উদ্দেশ্য সমূহ	বিষয়	নিরিক্ষকের কাজকর্ম	শিক্ষার্থীর কাজকর্ম
		সিদ্ধান্ত : ধৈর্য্য সহকারে শোনার জন্য আপনাকে ধন্যবাদ,আমি আশাকরি আপনি বুঝতে পেরেছেন অ্যানীমিয়া কি? কারণ,চিহ্ন,বৈশিষ্টি,সুচিকিৎসা এবং অ্যানীমিয়ার ঘরোয়া পরিচর্যা সম্পর্কে।		

APPENDIX – E

CERTIFICATE OF BENGALI EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation work on "A study to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls at selected settings, West Bengal." done by **Ms. Hephzibah Dorothy. J,** II year M.Sc. Nursing student of Omayal Achi College of Nursing, Puzhal, Chennai, is edited for Bengali language appropriateness by _____



APPENDIX – F

INFORMED CONSENT REQUISTION FORM

Good Morning !

I am HEPHZIBAH DOROTHY.J studying M.Sc. (Nursing) at Omayal Achi College of Nursing, Puzhal, Chennai. As a part of fulfillment of the programme, I am conducting "A study to assess the effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls at selected settings, West Bengal."

I request you to extend your cooperation and willingness in the study. Your responses will be kept confidential and will be used only for the research study.

Thanking you,

Signature of the Investigator

HEPHZIBAH DOROTHY.J

INFORMED CONSENT FORM

I understand that I am being asked to participate in a research study conducted by MS.HEPHZIBAH DOROTHY.J, M.sc Nursing 1st year, Omayal Achi College of Nursing Puzhal. This research study will evaluate the **"effectiveness of nutritional intervention package on knowledge and level of anemia among adolescent girls at selected settings, West Bengal."** If I agree to participate in the study, I will be giving small amount of blood to test my hemoglobin, structured questionnaires to answer for knowledge assessment and I will be undergoing physical assessment by the investigator and I have to consume the nutritional supplement everyday for stipulated days. The information collected will be kept confidential. No identifying information will be included during the analysis process. I understand that there is minimal risk associated with this study.

I realize that I may participate in the study if I am younger than 18 years of age with consent from my parent/ guardian. I realize that the knowledge gained from this study may help either me or other people in the future. I realize that my participation in this study is entirely voluntary, and I may withdraw from the study at any time I wish. If I decide to discontinue my participation in this study, I will continue to be treated in the usual and customary fashion.

I understand that all study data will be kept confidential. However, this information may be used in nursing publication or presentations. If I need to, I can contact HEPZHZIBAH DOROTHY.J, M.sc Nursing 1st year Omayal Achi College of Nursing Puzhal Phone No: 04426591617 at any time during the study.

The study has been explained to me. I have read and understood this consent form, my entire question has been answered, and I agree to participate. I understand that I will be given a copy of this signed consent form.

---------- ----------

Signature of Participant Date:

---------- ----------

Signature of Investigator Date:

অনুসন্ধানের জন্য অনুমতি পত্র

সুপ্রভাত!

আমি হেপসিবা ডরোথী.জে.চেন্নাই এর পুজহালে ওমায়ল আচি কলেজ অফ নাসিং-এ এম.এস.সি নাসিং নিয়ে পাঠরত.পাঠের পরিপূর্ণতার জন্য আমি' পশ্চিমবঙ্গের নির্বাচিত গ্রামাঞ্চলে কিশোরীদের মধ্যে অ্যানীমিয়ার জ্ঞান ও বিস্তারের উপর পুষ্ঠিগত কার্যাবলীর কর্মদক্ষতার বিশ্লেষণ'করছি.

এই পাঠের জন্য আমি আপনার সহয়তা ও সাহায্যের অনুরোধ করি আপনার জবাব গোপন থাকবে এবং কেবলমাত্র গবেষণা পাঠে ব্যবহৃত হবে.

ধন্যবাদান্তে

অনুসন্ধানকারীর স্বাক্ষর

হেপসিবা

ডরোথী.জে

অনুমতি প্রদান পত্র

আমি বুঝলাম যে আমার সন্তানকে-হ্যাফসিবা দোরোথি,অমোএল এছি কলেজ এর জে.এম.সি নারসিং ছাত্রী. অনুসন্ধান মুলক শিক্ষা কেন্দ্রে অংশ গ্রহণ করতে আমন্ত্রণ করা হয়েছে।এই অনুসন্ধান শিক্ষা হলো অ্যানীমিয়ার উপর পুষ্টির প্রতিক্রিয়া সম্পর্কিত।আমি জানি যে এখানে এই শিক্ষা গ্রহণে কোন ঝুকি নেই।আমি জানি যে যদি আমি আমার সন্তানকে এখানে যোগদান করার অনুমতি দিই।তবে তার পরীক্ষা নেওয়া হবে।এবং পরীক্ষাটি রেকর্ড করা হবে।আমি বুঝতে পারলাম যে এই শিক্ষা গ্রহণ করে যে জ্ঞান অর্জন করবে তা আমার সন্তান বা অন্য শিশুদের ভবিষ্যতে সাহায্য করবে।আমি জানলাম যে আমার সন্তানের অংশগ্রহণ নিজইচ্ছা,এবং আমি চাইলে এটা বন্ধ ও করতে পারি যদি আমি বন্ধ করি তাহলে আমার সন্তান আবার সাধারণ জিবন যাপন করবে আমি জানি যে সমস্ত শিক্ষা এবং ছবি সহ সংরক্ষিত হবে যাইহক,এই তথ্য নারসিং প্যাবলিসন্-এ ব্যাবহার করা হবে।যদি আমার দরকার হয় তবে আমি হ্যাফসিবা দোরোথি র সাথে যে কোন সময় যোগাযোগ করতে পারি।শিক্ষাটি আমার সামনে বলা হলো আমি এই ফর্মটি পড়লাম আর বুঝতে পারলাম। আমার সমস্ত প্রশ্নের উত্তর দেওয়া হয়েছে এবং আমি আমার সন্তানকে এখানে অংশ গ্রহণ করার অনুমতি দিলাম।আমি জানি যে আমাকে এই ফর্মের নকল দেওয়া হবে।.

আমি বুঝেছি যে সব গবেষণা তথ্য গোপন রাখা হবে। তবু ও এই তথ্য নার্সিং প্রকাশনার বা উপস্থাপনা ব্যবহার করা হতে পারে। গবেষণা চলাকালীন আমি হেফসিবা ডরথি, এম.এস.সি নার্সিং ১ ম বছর, ওমেয়াল আচি নার্সিং কলেজ,পুল্লাল,মোবাইল নম্বর ০৪৪২৬৫৯১৬১৭-এ দরকার হলে যে কোন সময়ে যোগাযোগ করতে পরি।

গবেষণা সম্পর্কে ব্যাখ্যা করা হয়েছে। এই সম্মতি ফর্মটা আমি পড়েছি এবং বুঝেছি। আমার সম্পূর্ণ প্রশ্নের উত্তর দেওয়া হয়েছে। এবং আমি অংশ গ্রহণের সম্মতি দিয়েছি।আমি বুঝেছি এই স্বাক্ষরিত সম্মতি ফর্ম একটি কপি আমাকে দেওয়া হবে।

_____ _____

অভিভাবক স্বাক্ষর তারিখ

_____ _____

অনুসন্ধানকারী স্বাক্ষর তারিখ

APPENDIX – G

DATA COLLECTION TOOL

STRUCTURED KNOWLEDGE QUESTIONAIRES TO COLLECT DEMOGRAPHIC DATA

SECTION – A DEMOGRAPHIC DATA

1. **Age of the adolescent girl in years**
    a. 13-15
    b. 16-17
    c. 17- 19

2. **Birth order of the adolescent girl**
    a. First Born
    b. Middle Child
    c. Last Born
    d. Only Child

3. **Education of the adolescent girl**
    a. Non-literate
    b. Primary education
    c. High school
    d. Higher secondary and above

4. **Education of the mother**
    a. Non-literate
    b. Primary education
    c. High school
    d. Higher secondary
    e. Graduation and above

5. Education of the father

a. Non-literate
b. Primary education
c. High school
d. Higher secondary
e. Graduation and above

6. Occupation of the adolescent girl

a. Student
b. Skilled
c. Home maker
d. Semi skilled
e. Self employed

7. Occupation of the father

a. Skilled
b. Semi-skilled
c. Unskilled
d. Self employed
e. Unemployed

8. Occupation of the mother

a. Skilled
b. Semi-skilled
c. Unskilled
d. Self employed
e. Home maker

9. Type of family

a. Joint
b. Nuclear
c. Extended
d. Separated

10. Total family income

a. Less than Rs.5000/-
b. Rs.5000/- Rs.10000/-
c. Rs.10000/- Rs.15000/-
d. More than 15000/-

11. Religion

a. Hindu
b. Christian
c. Muslim
d. Others

12. Age at menarche

a. <12 yrs
b. 12-14 yrs
c. 14-16 yrs
d. 16-19 yrs

13. Duration of menstrual cycle

a. 1-2 days
b. 3days
c. 4 days
d. 5 days
e. >5 days

14. Menstrual cycle

a. Regular
b. Irregular

15. Flow of menstruation

a. Normal
b. Scanty
c. Moderate
d. Heavy

16. Dysmennorhea

a. Yes
b. No

If Yes specify measures taken to relieve ----------

17. Any history of recent illness of diarrhoea/dysentery/fever/Pylori/worm

a. Yes
b. No

If Yes specify _____

18 . Previous visit to health centre for anemia menstrual problem/bleeding gums/fever/malaria/dengue/trauma etc

a. Yes
b. No

If yes specify, when_____

19. Any recent blood transfusion (3 Months)

a. Yes
b. No

If Yes specify when _____

20. Do you often feel tired or decreased activity?

a. Yes
b. No

21. **Do you often seem to be irritable?**

a. Yes
b. No

SECTION B: KNOWLEDGE QUESTIONAIRRE

INTRODUCTION INCLUDING GENERAL HEALTH AND NUTRITION

1. Which nutrient helps in growing
    a. Proteins
    b. carbohydrates
    c. fats
    d. vitamins

2. Which nutrients helps in getting energy
    a. proteins and vitamins
    b. carbohydrates and fats
    c. fats and vitamins
    d. vitamins and minerals

3. One of the following nutrient can cause increased blood pressure if taken in excess
    a. proteins
    b. carbohydrates
    c. fats
    d. vitamins

4. Which nutrient protects us from diseases
    a. proteins and vitamins
    b. carbohydrates and fats
    c. fats and vitamins
    d. vitamins and minerals

5. Following food items are rich in minerals and vitamins
    a. Rice and wheat
    b. Ghee and Cottage cheese
    c. Fish and chicken
    d. Fresh vegetables and fruits

6. Normal constituents of blood
    a. Fat
    b. Nerves
    c. Blood cells
    d. Fiber

7. Functions of blood
    a. Storage of nutrients absorbed from gut
    b. Cleaning away waste products
    c. Protects our body from diseases
    d. All of the above

8. Normal haemoglobin level in females
    a. 9-11gm / dL
    b. 8-10 gm / dL
    c. 5-8 gm/dL
    d. 12-14 gm /dL

9. Nutrients that contribute in the formation of haemoglobin
    a. Sodium and potassium
    b. Water and plasma
    c. Iron and protein
    d. Calcium and phosphorous

10. Anemia is
    a. Decrease in White Blood Cells
    b. Decrease in haemoglobin
    c. Decrease platelets
    d. Decrease in fats

ANEMIA - CAUSES AND SYMPTOMS

1. Who are at risk of developing anemia?
    a. New-born girls
    b. Adolescents
    c. Men above 30 yrs
    d. School age children

2. One of the following is the cause for anemia
    a. Intake of non-vegetarian food
    b. Increased menstrual flow
    c. Intake of iron containing foods
    d. Intake of foods contain starch

3. These are the symptoms of iron deficiency anemia, Except
    a. Abdominal pain
    b. Pale conjunctiva
    c. Irregular periods

4. Anemia can be identified by doing
    a. Urine test
    b. Blood test
    c. Stool test
    d. Sputum test

5. Food that can prevent the absorption of iron
    a. Fruits and fruit juices
    b. Vegetables and soups
    c. Tea and coffee
    d. Dates and Date syrup

TREATMENT AND COMPLICATIONS

1. Common sources of iron
    a. Rice and wheat
    b. Rasagolla and Sandesh
    c. Coffee and tea
    d. Dates and liver

2. In case of excessive menstrual flow
    a. Identify and treat the cause
    b. Traditional Healers
    c. Avoid hot foods
    d. Avoid foods rich in iron and proteins

3. Iron deficiency anemia is treated by
    a. Iron rich foods
    b. Iron supplements
    c. Iron injection
    d. All of the above

4. Home care management for Iron deficiency anemia is
    a. Eat food rich in starch
    b. Iron injection
    c. Green leafy vegetables
    d. Avoid cold foods

5. Complication of iron deficiency anemia
    a. Dental carries
    b. Stroke
    c. Diabetes
    d. Problem in pregnancy

PREVENTION

1. Iron Deficiency anemia can be prevented by taking
    a. Health drinks
    b. Cool drinks
    c. Dates syrup
    d. Phuchka

2. The right method to cook vegetables
    a. Cook for long time in low heat
    b. Cook for short time in high heat
    c. Cook all vegetables for 10 minutes only
    d. Cook all vegetables in salt water only.

3. The right method to cut vegetables for cooking is
    a. Wash and cut into large pieces
    b. Cut into small pieces and wash
    c. Chop and mince
    d. Mince and grind

4. Iron absorption can be enhanced by taking
    a. Coffee
    b. Lime juice
    c. Milk
    d. Tea

5. The best time to take Iron rich foods is
    a. After breakfast
    b. One hour before meals or two hours after food
    c. Before dinner
    d. After lunch

SCORING KEY

Scoring key for height and weight

Score	Interpretation (weight)	Interpretation (height)
>75 %	Adequate mean weight	Adequate mean height
51-75%	Moderately adequate mean weight	Moderately adequate mean height
< 51 %	Inadequate mean weight	Inadequate mean height

Scoring key for Knowledge

Each item was a closed ended multiple choice questions with single correct answer. Each correct response was awarded with a score of '1' mark and the wrong question was awarded with a score of '0' marks. Total score was 25. Maximum score was 25 and minimum score was '0'.

Score	Interpretation
>75 %	Adequate knowledge
51-75%	Moderately adequate knowledge
≤50 %	Inadequate knowledge

ICMR hemoglobin scale

1. Normal Hb levels : 12.0–14 g/dL
2. Mild anemia : 10.0–11.9 g/dL
3. Moderate anemia : 7.0–9.9g/dL
4. Severe anemia : < 7.0 g/dL
5. Very severe Anemia : < 4.0 g/dL

Clinical Assessment Scoring Key.

It consisted of 6 signs, if any one sign is present the score was '1' and if it is not present the score was given '0'

1. Scanty hair
2. Pallor
3. Pale conjunctiva
4. Pale Lips
5. Koilonychias
6. Pale nails

IRON RICH FOODS FOR HEALTHY BLOOD AND HEALTHY GENERATION

RED MEAT

FISH

OYSTER

LIVER

EGG YOLK

GREEN LEAFY VEGETABLES

LENTILS

ALMONDS

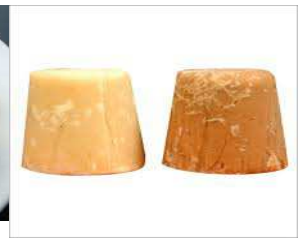
DATES

DATES SYRUP

CABBAGE

SUNFLOWER SEEDS

BAKED POTATO



JAGGERY

DRUMSTICK LEAVES

WATER MELON

BEETROOT

GARDEN CRESS SEEDS

আয়রন যুক্ত খাদ্য বিশুদ্ধ রক্ত এবং বংশ পর্যায়ের বৃদ্ধির জন্য প্রয়োজন


লাল মাংস


মাছ


ঝিনুক


যকৃৎ


ডিমের কুসুম


শাক ও সবুজ পাতা


ছোলা


বাদাম


খেঁজুর


খেজুর গুড়


বাঁধাকপি


সূর্যমুখী বীজ


সেঁকা আলু


গুর


সজনে পাতা


তরমুজ


বীট


বাগানে উৎপন্ন শাকের বীজ

তথ্য সংগ্রহকারীমাধ্যম

লোক পরিসংখান সংক্রান্ত তথ্য সংগ্রহকারী প্রশ্নাবলী বিভাগ ক- এক

লোক পরিসংখান তথ্য

অধ্যায় এক

১। কিশোরীর বয়স

ক)১৩-১৫

খ)১৬-১৭

গ)১৭-১৯

২। কিশোরীর জন্মক্রম

ক)প্রথমে জন্ম হয়েছে।

খ)মাঝখানে জন্ম হয়েছে।

গ)শেষে জন্ম হয়েছে।

ঘ)একমাত্র সন্তান।

৩। কিশোরীর শিক্ষা

ক)অশিক্ষিত।

খ)প্রাথমিক।

গ)মাধ্যমিক স্কুল।

ঘ)উচ্চমাধ্যমিক এবং তার উপরে।

৪। মায়ের শিক্ষা

ক)অশিক্ষিত।

খ)প্রাথমিক।

গ)মাধ্যমিক স্কুল।

ঘ)উচ্চমাধ্যমিক।

ঙ)গ্রাজুয়েট এবং তার উপরে।

৫। পিতার শিক্ষা

ক)অশিক্ষিত।

খ)প্রাথমিক।

গ)মাধ্যমিক স্কুল।

ঘ)উচ্চমাধ্যমিক।

ঙ)গ্রাজুয়েট এবং তার উপরে।

৬। কিশোরীর জীবিকা/পেশা

ক)ছাত্রী।

খ)কাজে শিক্ষাপ্রাপ্ত।

গ)বাড়ীর কাজ করে।

ঘ)কাজে অল্প শিক্ষাপ্রাপ্ত।

ঙ)স্ব-নির্ভর।

৭। পিতার জীবিকা/পেশা

ক)কাজে শিক্ষাপ্রাপ্ত।

খ)কাজে অল্প শিক্ষাপ্রাপ্ত।

গ)অ-দক্ষ।

ঘ)স্ব-নির্ভর।

ঙ)বেকার।

৮। মায়ের পেশা

ক)কাজে শিক্ষাপ্রাপ্ত।

খ)কাজে অল্প শিক্ষাপ্রাপ্ত।

গ)অ-দক্ষ।

ঘ)স্ব-নির্ভর।

ঙ)বাড়ির কাজ করে।

৯। পরিবারের প্রকার

ক)যুক্ত পরিবার।

খ)একক পরিবার।

গ)বিস্তৃত পরিবার।

ঘ)বিচ্ছিন্ন পরিবার।

১০। পরিবারের আয়

ক)৫০০০ টাকার কম।

খ)৫০০০-১০০০০ এর মধ্যে।

গ)১০০০০-১৫০০০ এর মধ্যে।

ঘ)১৫০০০ এর বেশী।

১১। ধর্ম

ক)হিন্দু

খ)খ্রীষ্টান

গ)মুসলিম

ঘ)অন্যান্য

১২। প্রথম রজস্রাব (মাসিক)-এর সময়

ক)১২ বছরের কম।

খ)১২-১৪ বছরের মধ্যে।

গ)১৪-১৬ বছরের মধ্যে।

ঘ)১৬-১৯ বছরের মধ্যে।

১৩। মাসিকের সময় সীমা

ক)১-২ দিন।

খ)৩ দিন।

গ)৪ দিন।

ঘ)৫ দিন।

ঙ)৫ দিনের বেশী।

১৪। রজস্রাবের কালচক্র

ক)নিয়মিত।

খ)অনিয়মিত।

১৫। রজস্রাব (মাসিক)-এর প্রবাহ

ক)সাধারণ

খ)অল্প

গ)মাঝামাঝি

ঘ)খুব বেশী।

১৬। অস্বাভাবিক রজস্রাব(মাসিক)

ক)হ্যাঁ

খ)না

যদি হ্যাঁ তবে এর উপশমের জন্য কি করেছেন।

১৭। কিছুদিন আগে কি ডায়রিয়া/আমশায়া-পায়খানা/জ্বর/পায়লোরী/কৃমি হয়েছে।

ক)হ্যাঁ

খ)না

যদি হ্যাঁ সেটি হল_____

১৮। অ্যানীমিয়ার মাসিক সমস্যা/মাড়ি থেকে রক্ত পড়া/ম্যালেরিয়া/ডেঙ্গু/ক্ষত হত্যাদির জন্য গতবারে কি স্বাস্থ্য কেন্দ্রে গিয়েছিলে?

ক)হ্যাঁ

খ)না

যদি হ্যাঁ হয় তবে কখন_____

১৯। গত তিনমাসের মধ্যে কি রক্তের আদান-প্রদান করেছেন

ক)হ্যাঁ

খ)না

যদি করে থাকেন তার বিবরণ_____

২০। আপনি কি কাজ করতে গিয়ে প্রায় ক্লান্ত বোধ করেন অথবা কাজকর্ম পুরো করতে পারেন না।

ক)হ্যাঁ

খ)না

২১। আপনি কি অনেক সময় বিরক্তবোধ করেন?

ক)হ্যাঁ

খ)না

জ্ঞানমূলক প্রশ্নাবলী

সাধারন স্বাস্থ্য এবং পুষ্টি সহ ভূমিকাঃ

১। কোণ খাদ্যগুণ বৃদ্ধিতে সহায়তা করে?

ক)প্রোটীন

খ)কার্বহাইড্রেড

গ)স্নেহজাতীয় পদার্থ বা চর্বি

ঘ)ভিটামিন

২। কোন খাদ্যগুণ শক্তি পেতে সাহায্য করে?

ক)স্নেহজাত পদার্থ/প্রোটীন/ভিটামিন।

খ)শর্করা ও চর্বি

গ)তৈল জাতিয়/চর্বি জাতিয় এবং ভিটামিন

ঘ)ভিটামিন এবং খনিজ পদার্থ

৩। এ গুলির মধ্যে কোনটি বেশী খেলে রক্ত-চাপ বৃদ্ধি করে?

ক)প্রোটিন

খ)কার্বহাইড্রিক

গ)চর্বি জাতিয় খাদ্য

ঘ)ভিটামিন

৪। কোন খাদ্যর গুন রোগ থেকে বাঁচায়?

ক)প্রোটিন ও ভিটামিন

খ)শর্করা ও চর্বি জাতিয় পদার্থ

গ)চর্বি জাতিয় পদার্থ এবং ভিটামিন

ঘ)ভিটামিন এবং খনিজ পদার্থ

৫। নিম্নের ফল তালিকা গুলির কোনটি খনিজ পদার্থে এবং ভিটামিন যুক্ত?

ক)চাউল ও আটা

খ)ঘি ও ছানা

গ)মাছ এবং মাংস

ঘ)সতেজ শাক-সব্জি এবং ফলমূল

১। রক্তের সাধারণ উপাদান

ক)চর্বি।

খ)স্নায়ু।

গ)রক্ত কোষ।

ঘ)তন্তু।

২। রক্তের কার্যাবলী

ক)রক্ত থেকে শোষীত খাদ্যাতন সঞ্চয় করে।

খ)বর্জ্যপদার্থ বাহির করে দেয়।

গ)রোগ থেকে আমাদের শরীরকে রক্ষা করে।

ঘ)উপরে সবগুলি।

৩। মহিলাদের রক্তে সাধারণ হিমোগ্লোবিনের পরিমাণ

ক)৯-১১ গ্রাম/ডি. এল

খ)৮-১০ গ্রাম/ডি. এল

গ)৫-৮ গ্রাম/ডি. এল

ঘ)১১-১৫ গ্রাম/ডি. এল

৪। রক্তে হিমোগ্লোবিন তৈরীতে কোন খাদ্য উপাদানের প্রয়োজন হয়

ক)সোডিয়াম এবং পটাশিয়াম।

খ)জল এবং প্লাজমা।

গ)আয়রণ এবং প্রোটিন।

ঘ)ক্যালসিয়াম এবং ফস্ফরাস

৫। অ্যানীমিয়া হল

ক)শ্বেত রক্ত কণিকা কম করে

খ)রক্তে হিমোগ্লোবিন কমে যাওয়া

গ)প্ল্যাটেলেট্-এর

ঘ)চর্বি কমে যাওয়া

আয়রণের অভাবে অ্যানীমিয়া হওয়ার কারণ এবং লক্ষণ সমূহ

১। কারা আয়রনের অভাবে অ্যানিমিয়ার শিকার হন?

ক)নবজাত বালিকা

খ)কিশোর/কিশোরী

গ)৩০ বছরের উর্দ্ধে পুরুষেরা

ঘ)বিদ্যালয়ে পাঠরত শিশুরা।

২। নিম্নের যে কোন একটির কারণে আয়রণের অভাবে অ্যানীমিয়া হয়ে থাকে

ক)আমিষ খাদ্য গ্রহণের ফলে

খ)অতিরিক্ত মাসিক হওয়ার ফলে

গ)আয়রণ যুক্ত খাদ্যের ফলে

ঘ)মাড় যুক্ত খাদ্যের ফলে

৩। বিদ্যালয়ে পাঠরত শিশুরা

ক)তল পেটে ব্যাথা

খ)ফ্যাকাসে হয়ে যাওয়া

গ)অনিয়মিত মাসিক হওয়ার ফলে

ঘ)ক্লান্ত হয়ে যাওয়া

৪। কোন পরীক্ষার মাধ্যমে অ্যানীমিয়া জানা যায়?

ক)মূত্র পরীক্ষা

খ)রক্ত পরীক্ষা

গ)মল পরীক্ষা

ঘ)থুতু পরীক্ষা

৫। কোন খাবার আয়রণ গ্রহণ করার ক্ষমতা কমিয়ে দেয়।

ক)ফল এবং ফলের রস

খ)শাক-সবজি এবং ঝোল

গ)চা এবং কফি

ঘ)খেজুর এবং খেজুরের রস

চিকিৎসা এবং জটিলতা

১। আয়রণের সাধারণ উৎস

ক)চাল ও আটা।

খ)রসগোল্লা ও সন্দেশ

গ)চা এবং কফি

ঘ)খেজুর ও যকৃৎ

২। অতিরিক্ত মাসিকের সময়

ক)রোগের কারণ নির্নয় এবং চিকিৎসা

খ)প্রথাগত চিকিৎসা করা।

গ)গরম খাবার না খাওয়া

ঘ)আয়রণ এবং প্রোটীন যুক্ত খাবার খাওয়া।

৩। আয়রণের অভাবজনিত অ্যানীমিয়ার চিকিৎসা হয়

ক)আয়রন যুক্ত খাদ্য-দ্বারা

খ)আয়রণ যুক্ত সিরাপ বা ট্যাবলেট।

গ)আয়রণ ইঞ্জেক্শন্

ঘ)উপরোক্ত সবগুলি

৪। আয়রণের অভাবজনিত অ্যানীমিয়ার ঘরোয়া চিকিৎসা হয়

ক)মাড়যুক্ত খাদ্য খাওয়া

খ)আয়রণ ইঞ্জেক্শন্ নেওয়া।

গ)সবুজ পাতার শাক-সব্জী খাওয়া।

ঘ)ঠান্ডা খাদ্য এড়িয়ে চলা।

৫। আয়রণের অভাবে হওয়া অ্যানীমিয়ার জটিলতা

ক)দাঁতের সমস্যা।

খ)হৃদাক্রান্ত/স্ট্রোক।

গ)ডায়বেটিক্স।

ঘ)গর্ভধারনে সমস্যা।

নিবারণ

১। আয়রণের অভাবে হওয়া অ্যানীমিয়া প্রতিরোধ করা যেতে পারে নিম্নলিখিত খাদ্য গ্রহণের ফলে

ক)স্বাস্থ্যকর পানীয়।

খ)ঠান্ডা পানীয়।

গ)খেজুর রসের সিরাপ।

ঘ)ফুচকা।

২। রান্নার জন্য সবজী কাটার সঠিক পদ্ধতি হল।

ক)ধুয়ে বড় বড় টুকরো করে কাটা

খ)ছোট ছোট টুকরো করে কেটে ধোয়া

গ)ছোট ছোট টুকরো মিশিয়ে ফেলা

ঘ)মিশিয়ে বেটে নেওয়া।

৩। শাক-সবজী রাধাঁর সঠিক পদ্ধতি হল

ক)অল্প আঁচে দীর্ঘ সময় ধরে রাঁধা

খ)অধিক আঁচে অল্প সময় ধরে রাঁধা

গ)সমস্ত শাক-সবজী ১০ মিনিট ধরে রাঁধা

ঘ)সমস্ত শাক-সবজী কেবল লবণজলে রান্না করা।

৪। পান করার ফলে আয়রণের ঘাঁড়তি মেটান যেতে পারে।

ক)মোসম্বীর রস

খ)কফি

গ)দুধ

ঘ)চা

৫। আয়রণযুক্ত খাদ্য খাওয়ার উপযুক্ত সময় হল

ক)সকালে খাওয়ার পর।

খ)খাদ্য খাওয়ার এক ঘন্টা আগে বা খাওয়ার দুই ঘন্টা পরে।

গ)রাতে ভোজনের পূর্বে।

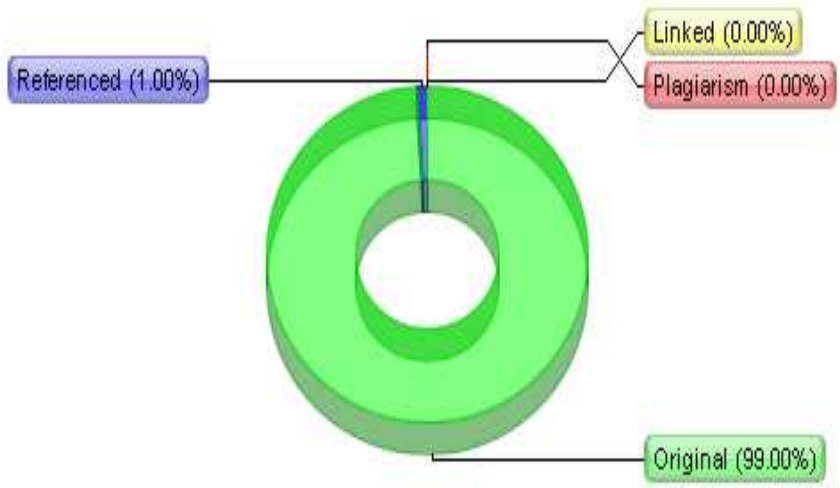
ঘ)দুপুরে খাওয়ার পরে।

APPENDIX – H

PLAGIARISM REPORT

Hyperlink	:	**http://plagiarism-detector.com**
Generation Time and Date	:	08-02-2014 13:03:13
Document Name	:	plagiarism --- Hephzibah Dorothy J.docx
Document Location	:	H:\plagiarism --- Hephzibah Dorothy J.docx
Document Words Count	:	23031
Check time (seconds)	:	49

Plagiarism Detection Chart:



Referenced 1% / Linked 0%

Original - 99% / 0% - Plagiarism

Signature of the Investigator

Signature of the Principal

APPENDIX – I

CODING FOR THE DEMOGRAPHIC VARIABLES

SECTION –A DEMOGRAPHIC DATA

S.NO	DEMOGRAPHIC VARIABLES	CODING
1	**Age of the adolescent girl in years**	
	13-15	1
	16-17	2
	17- 19	3
2	**Birth order of the adolescent girl**	
	a. First Born	1
	b. Middle Child	2
	c. Last Born	3
	d. Only Child	4
3	**Education of the adolescent girl**	
	a. Non-literate	1
	b. Primary education	2
	c. High school	3
	d. Higher secondary and above	4
4	**Education of the mother**	
	a. Non-literate	1
	b. Primary education	2
	c. High school	3
	d. Higher secondary	4

S.NO	DEMOGRAPHIC VARIABLES	CODING
	e. Graduation and above	5
5	**Education of the father**	
	a. Non-literate	1
	b. Primary education	2
	c. High school	3
	d. Higher secondary	4
	e. Graduation and above	5
6	**Occupation of the adolescent girl**	
	a. Student	1
	b. Skilled	2
	c. Home maker	3
	d. Semi skilled	4
	e. Self employed	5
7	**Occupation of the father**	
	a. Skilled	1
	b. Semi-skilled	2
	c. Unskilled	3
	d. Self employed	4
	e. Unemployed	5
8	**Occupation of the mother**	
	a. Skilled	1
	b. Semi-skilled	2
	c. Unskilled	3

S.NO	DEMOGRAPHIC VARIABLES	CODING
	d. Self employed	4
	e. Home maker	5
9	**Type of family**	
	a. Joint	1
	b. Nuclear	2
	c. Extended	3
	d. Separated	4
10	**Total family income**	
	a. Less than Rs.5000/-	1
	b. Rs.5000/- Rs.10000/-	2
	c. Rs.10000/- Rs.15000/-	3
	d. More than 15000/-	4
11	**Religion**	
	a. Hindu	1
	b. Christian	2
	c. Muslim	3
	d. Others	4
12	**Age at menarche**	
	a. <12 yrs	1
	b. 12-14 yrs	2
	c. 14-16 yrs	3
	d. 16-19 yrs	4
13	**Duration of menstrual cycle**	

S.NO	DEMOGRAPHIC VARIABLES	CODING
	a. 1-2 days	1
	b. 3days	2
	c. 4 days	3
	d. 5 days	4
	e. >5 days	5
14	**Menstrual cycle**	
	a. Regular	1
	b. Irregular	2
15	**Flow of menstruation**	
	a. Normal	1
	b. Scanty	2
	c. Moderate	3
	d. Heavy	4
16	**Dysmennorhea**	
	a. Yes	1
	b. No	2
	If Yes specify measures taken to relieve	
17	**Any history of recent illness of Diarrhoea/dysentery/fever/Pylori/worm**	
	a. Yes	1
	b. No	2
	If Yes specify _____	

S.NO	DEMOGRAPHIC VARIABLES	CODING
18	**Previous visit to health centre for anemia menstrual problem/bleeding gums/fever/malaria/dengue/trauma etc**	
	a. Yes	1
	b. No	2
	If yes specify, when_____	
19	**Any recent blood transfusion (3 Months)**	
	a. Yes	1
	b. No	2
	If Yes specify when_____	
20	**Do you often feel tired or decreased activity?**	
	a. Yes	1
	b. No	2
21	**Do you often seem to be irritable?**	
	a. Yes	1
	b. No	2

APPENDIX – J

BLUE PRINT

S.No.	Content	Item	Total Item	Percentage
1	Demographic variables	1-21	21	
2	Knowledge Education on anemia	1 - 25	25	54.34%
	Total	**46**	**46**	**100%**

APPENDIX – K

INTERVENTIONAL TOOL

SECTION 1: EDUCATION ON ANEMIA WAS ADMINISTERED THROUGH VIDEO SHOW AND POSTER PRESENTATION

- **Video Show included the aspects of**

- Introduction to general health, nutrition and anemia
- Causes and signs and symptoms of anemia
- Diagnosis of anemia
- Treatment of anemia
- Home Care management of anemia.

- **Poster-was projected on iron rich diet.**

SECTION 2.ADMINISTARTION OF NUTRITIONAL SUPPLEMENT

- **Administration of Tab.Albendazole** 400mg in empty stomach to deworm and administration of curd 50ml, after six hours of deworming to promote the growth of healthy bacteria in the intestines for all adolescent girls with mild, moderate and severe anemia.
- **Administration of 300ml of drumstick leave juice**, with iron fortified salt and lime juice was given two hours before lunch every day for 7 days , for each adolescent girl with mild, moderate and severe anemia.

  Preparation of drumstick leave juice : Preparation included, adding of 3 kg of clean washed drumstick leaves in 3 litres of boiling water and cooking for 10 minutes, and strained. Then 750 Gms of jaggery was dissolved in this strained drumstick leaves juice and once again strained .Then 10 Gms of iron fortified salt and juice from 5 lemons was dissolved in the drumstick leave juice when it was luke warm.
- **Administration of 75 Gms of boiled Bengal gram dhal** with iron fortified salt and lime juice was given was given one hours before lunch every day for 7 days for each adolescent girl with mild, moderate and severe anemia.

  Preparation of boiled bengal gram dhal : To prepare boiled bengal gram dhal, 750 Gms of dhal was soaked for 2 hours in water and boiled with 10 grams of iron fortified salt in the pressure cooker. Then juice of 5 lemons was added.

APPENDIX – L

M.Sc (N) RESEARCH EXECUTION PLAN

S.NO	ACADEMIC CALENDER MONTHS	MAY 2012 to APRIL 2013												MAY 2013 to APRIL 2014											
		M	J	JU	A	S	O	N	D	J	F	M	A	M	J	JU	A	S	O	N	D	J	F	M	A
A	**Conceptual phase**																								
1	Problem identification																								
2	Literature review																								
3	Clinical fieldwork																								
4	Theoretical framework																								
5	Hypothesis formulation																								
B	**Design & planning phase**																								
6	Research design																								
7	Intervention protocol																								
8	Population specification																								
9	Sampling plan																								
10	Data collection plan																								
11	Ethics procedure																								
12	Finalization of plans																								
C	**Empirical phase**																								
13	Data collection																								
14	Data preparation																								
D	**Analytical phase**																								
15	Data analysis																								
16	Interpretation of results																								
E	**Dissemination phase**																								
17	Presentation or report																								
18	Utilization of findings																								
	Calendar months	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4

MANAGEMENT OF ANEMIA

LESSON PLAN ON MANAGEMENT OF ANEMIA

SUBJECT **:** Management of anemia

GROUP **:** Adolescent girls with anemia

PLACE **:** Kachkumrakali Village, West Bengal

DURATION **:** 30 minutes

TEACHING METHOD **:** Lecture cum discussion

INSTRUCTOR **:** Investigator

INSTRUCTIONAL AID **:** Technology integrating teaching using power point, video show and posters

GENERAL OBJECTIVES **:** At the end of the class the adolescent girls will be able to gain knowledge on management of anemia and gain a positive attitude regarding prevention of anemia

SPECIFIC OBJECTIVES **:** At the end of the class the adolescents will be able to,

- state the meaning of health and nutrition
- state the meaning of anemia
- list the causes of anemia
- enumerate the signs and symptoms and diagnosis of anemia
- explain the various treatment methods and complications of anemia
- list down the preventive measures of anemia
- elaborate the home care management of anemia.

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
		INTRODUCTION ✓ Anemia commonly known as less blood in the body. Globally, anemia affects 1.62 billion people. India is one of the top most country with high anemia. It is particularly present in 60 to 70 percent of the adolescent girls.		
1.	state the meaning of health and nutrition	**INTRODUCTION TO HEALTH AND NUTRITION** ✓ Health is not only freedom from sickness,it is a feeling of wellbeing in terms of physical, psychological, social and spiritual aspects. ✓ Nutrition is a word used to indicate adequate intake of healthy foods. For a healthy life good nutrition is very important especially for adolescent girls to prevent anemia. Eating right food which has all the nutrients such as protein, carbohydrates, fat, water, vitamins, and minerals will help in improving health, in particular iron rich foods are important to prevent anemia.	Lecture cum discussion by using power point	Listening

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
2.	state the meaning of anemia	**MEANING OF ANEMIA** ✓ Anemia is a condition that develops when the blood lacks enough healthy red blood cells or hemoglobin. Hemoglobin is a main part of red blood cells and carry oxygen to the body's tissues. If there are too few or abnormal red blood cells, or if the hemoglobin is abnormal or low, the cells in your body will not get enough oxygen.	Lecture cum discussion using power point	Listening
3.	list the causes of anemia	**CAUSES OF ANEMIA** There are many causes for anemia ,but iron deficiency is the most common cause for development of anemia among adolescents. The risk factors include ✓ Iron-deficiency mainly due to heavy periods and lack of iron in the diet ✓ Poor absorption of iron ✓ Pregnancy where there is increased demand by the growing fetus ✓ Blood loss ✓ Anemia caused by decreased or faulty red blood cell production ✓ Destruction of red blood cells ✓ Vitamin deficiency	Lecture cum discussion using power point and video	Listening

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
		✓ Bone marrow and stem cell problems ✓ Certain disease conditions and drugs ✓ Other health conditions		
4.	enumerate the signs and symptoms and diagnosis of anemia	**SIGNS AND SYMPTOMS OF ANEMIA** ✓ Fatigue and weakness ✓ Pale skin and mucous membranes ✓ Rapid heartbeat or a new heart murmur ✓ Irritability ✓ Decreased appetite ✓ Dizziness or a feeling of being lightheaded ✓ Pica ,ie a craving to eat nonfood items such as paint chips, chalk, or dirt. Pica may be caused by a lack of iron in the diet. ✓ Increased heart rate, which strains your heart and puts you at higher risk for heart attack and stroke **DIAGNOSIS** ✓ History ✓ Physical Examination ✓ Hemoglobin Estimation	Lecture cum discussion using power point	Listening

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
5.	explain the various treatment methods and complications of anemia	**TREATMENT FOR ANAEMIA** ✓ Regular Deworming ✓ Iron supplements ✓ Iron and Protein rich foods ✓ Multivitamin supplementation in specific, folic acid, vitamin B 12 and vitamin C to enhance iron absorption ✓ If the anaemia is severe it may possibly be life-threatening that hospitalization and a blood transfusion may be required. **COMPLICATIONS** Mild anemia usually doesn't cause complications. However, left untreated, anemia can become severe and lead to health problems, including the following: ✓ **Heart problems:** Anemia may lead to a rapid or irregular heartbeat. The heart must pump more blood to compensate for the lack of oxygen carried in the blood when a person is anemic. This can lead to an enlarged heart or heart failure.	By using power point presentation	Listening

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
		✓ **Problems during pregnancy:** In pregnant women, severe anemia has been linked to premature births and low birth weight babies. But the condition is easily preventable in pregnant women who receive iron supplements as part of their prenatal care. ✓ **Growth problems:** In infants and children, severe iron deficiency can lead to anemia as well as delayed growth and development. Additionally, anemia is associated with an increased susceptibility to infections.		
6.	list down the measures to prevent anemia.	**<u>PREVENTION</u>** ✓ Iron supplements ✓ Iron and protein rich foods ✓ Regular deworming ✓ Exercise and activity ✓ Avoiding tea and coffee as it decreases iron absorption ✓ Inclusion of Vitamin C to enhance iron absorption ✓ Avoid early marriage ✓ A minimum of 3 years interval between children	Lecture cum discussion using power point presentation	Listening

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
9	To elaborate the home care management of anemia	**HOME CARE MANAGEMENT** Apart from the regular treatment there are plenty of home based foods that can prevent as well as prevent anemia.The list is given below. Also an example of how to prepare a simple nutritional supplement with locally available use of resources. **IRON RICH INDIAN FOODS** **These are some of the Indian foods that contains iron** ✓ Red meat ✓ Garden cress seeds ✓ Drumstick leaves ✓ Spinach and all green leafy vegetables ✓ Jaggery ✓ Broccoli ✓ Fenugreek ✓ Cabbage ✓ Corn ✓ Dates ✓ Almonds ✓ Beetroot	Lecture cum discussion and poster	Listening

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
		✓ Baked Potato ✓ Soyabean ✓ Carrots ✓ Watermelon ✓ Sunflower seeds ✓ Green peas ✓ Bengal gram dhal ✓ Liver ✓ Egg yolk ✓ Fish ✓ Oyster **HOW TO PREPARE DRUMSTICK LEAVE JUICE** **ITEMS NEEDED FOR 300 ML OF JUICE** **Drumstick leave 300gms** **Jaggery 75gms** **Salt 1 gm** **lime Extract of ½ a lemon** 300 gms of clean washed drumstick leaves is put in 300ml of boiling water and cooked for 10 minutes and strained. Then 75 gms of jaggery is dissolved in this strained drumstick leaves juice and		

S.NO	CONTRIBUTORY OBJECIVES	CONTENT	INVESTIGATOR'S ACITIVITY	LEARNER'S ACTIVITY
		once again strained .Then 1 gms of Iron fortified salt and extract from 1/2 lemon is dissolved in the juice when it was luke warm.		
		Conclusion: Thank you very much for your patience listening, I hope you have understood about the what is anemia, causes, signs and symptoms, diagnosis , treatment ,complications and the home care management of anemia.		